EB8000 Serial User Guide

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Chapter 1 EasyBuilder 8000 Installation

1. EasyBuilder 8000 Installation

(1) Software:

Download from EasyBuilder 8000 CD or visit Weintek Labs, Inc.'s website at http://www.weintek.com to obtain all available software editions (including Simplified Chinese, Traditional Chinese and English version) and latest upgraded files.

The EasyBuilder 8000 software is also called EB8000 in the following illustration of this chapter and the other chapters of the manual.

(2) Hardware Requirements (Recommended):

CPU: INTEL Pentium II or above
Memory: 64MB or above
Hard Disk: 2.5GB or above (Disc space available at least 10MB)
CD-ROM: 4X or above
Display: 256 color SVGA with 800 x 600 resolution or greater
Keyboard and Mouse: One for each
Ethernet: for project downloading/uploading
RS-232 COM: At least one RS-232 serial port available for on-line simulation
Printer

(3) Operating System:

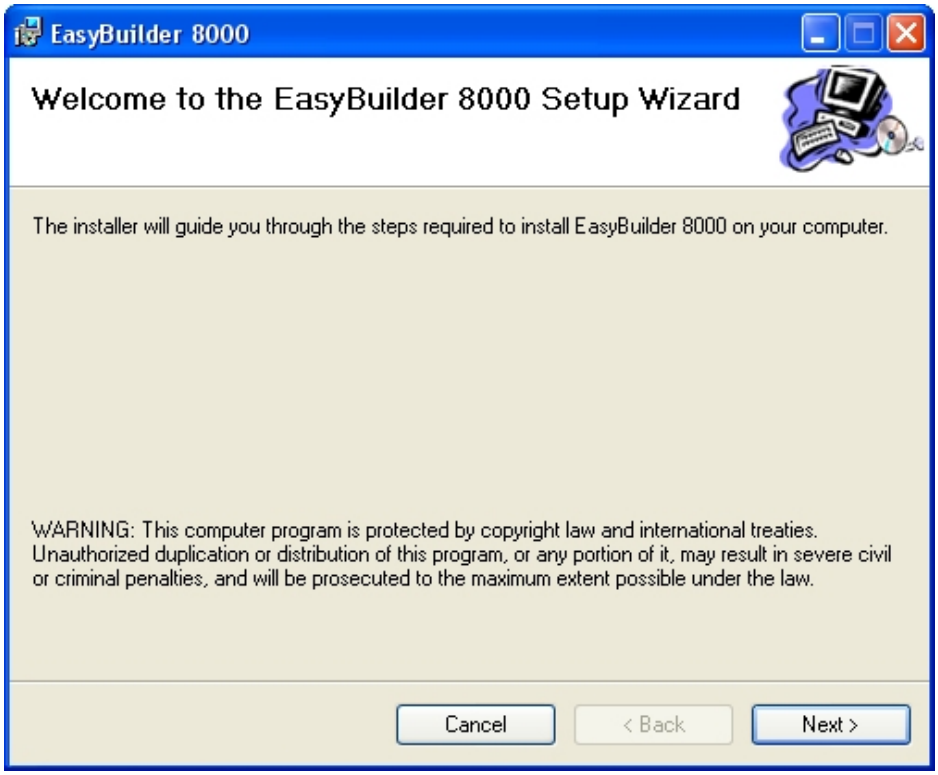
Windows 2000 /Windows XP

(Windows XP Professional, the maximum number of other computers that are permitted to simultaneously connect over the network is ten. This limit includes all transports and resource sharing protocols combined. For Windows XP Home Edition, the maximum number of other computers that are permitted to simultaneously connect over the network is five.)

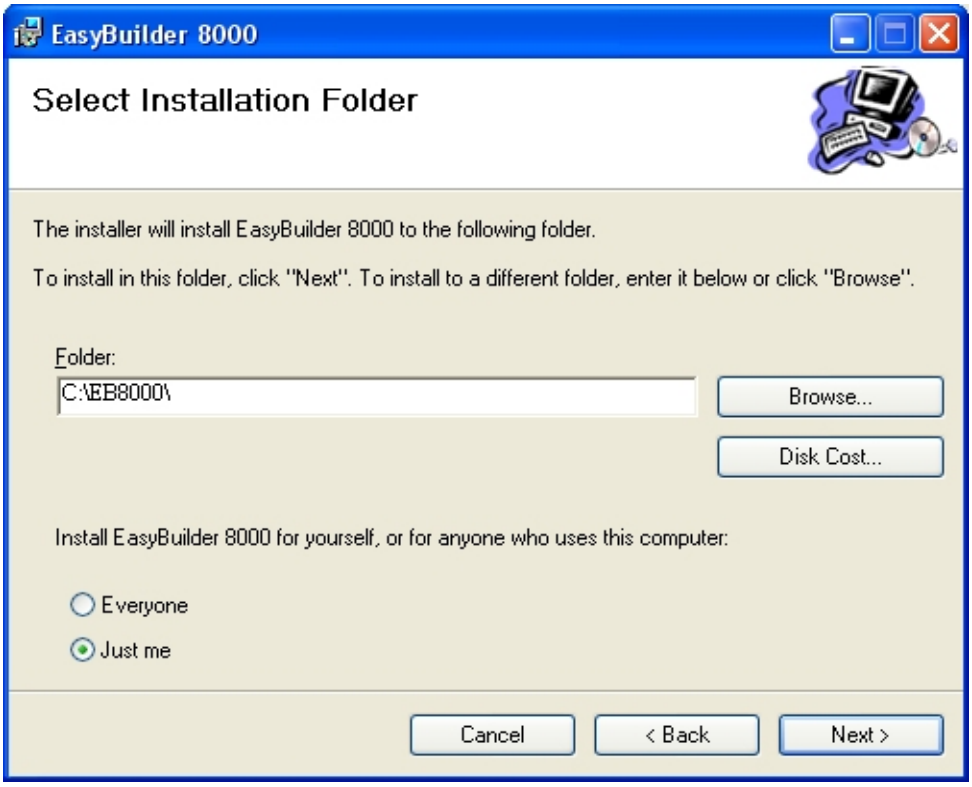
(4) Installation:

1) When putting the EB8000 CD into CD Rom, the Autorun program will automatically execute by computer. Or run [Anutorun.exe] from the root directory manually and the screen shows as below:

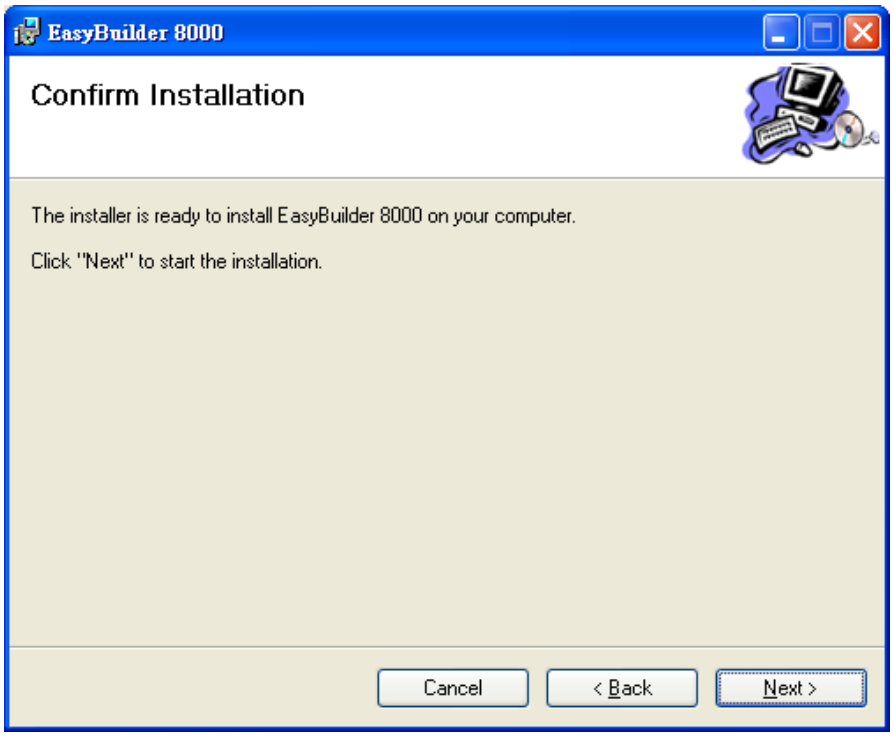
2) Click [Install] and the screen appears as below:



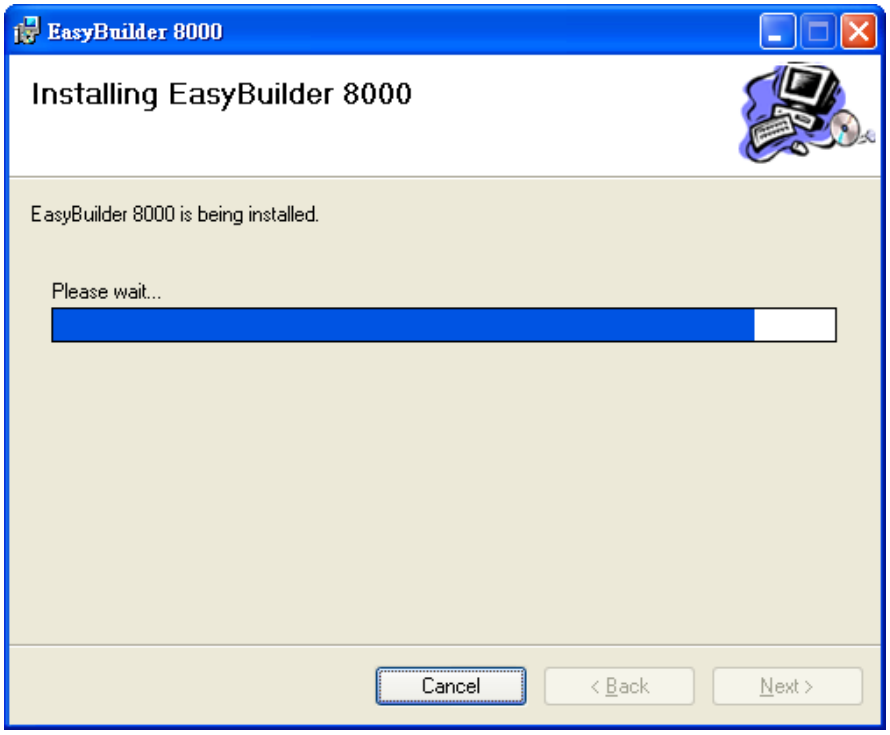
3) Follow the instructions and click [Next].



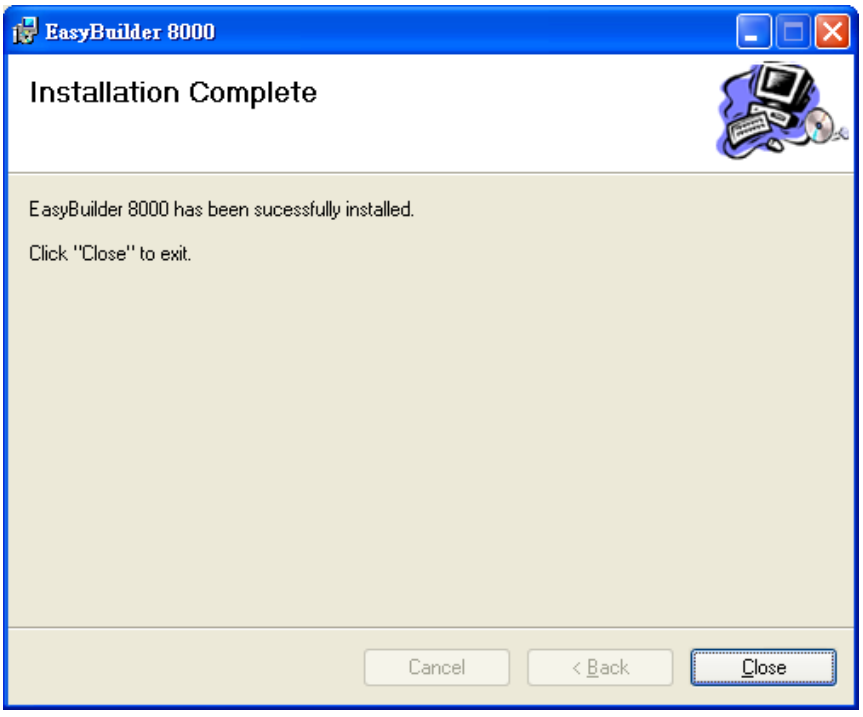
4) Select the target file for software installation or select suggestive path and then click [Next].



Click “Next” to confirm the installation.



Installation processing



Click” Close” to complete the installation.

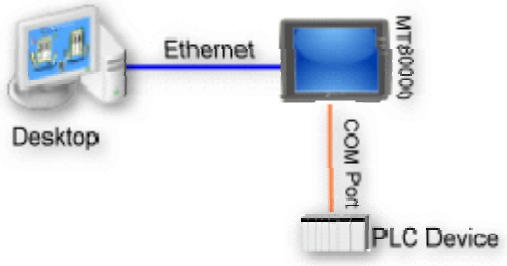
5) Chose menu [Start] / [Programs] / [EasyBuilder8000] to start the program.

The identification of each selection under the directory of the software:

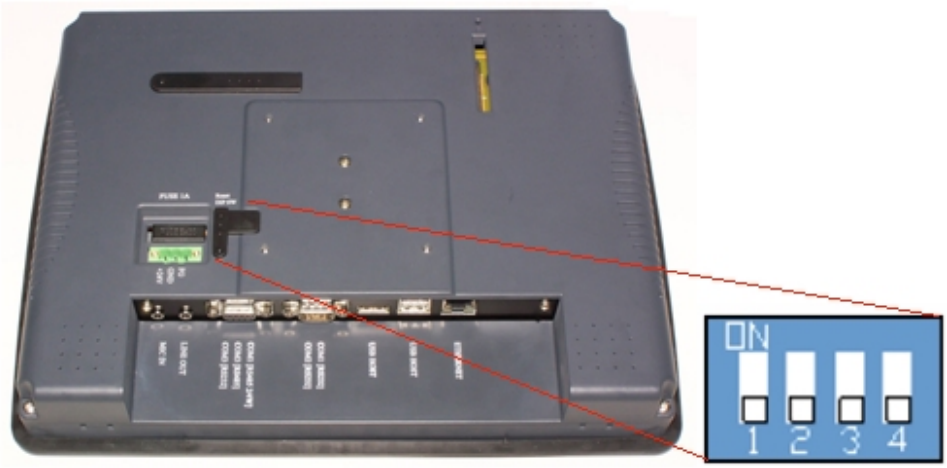
EasyBuilder8000	EB8000 touch screen editing software
Project Manager	MT8000 integration management software
ReleaseNote.pdf	Software version and latest information

2. System Connection

Typical connection for the application of MT8000 series as below:



Connection interfaces equipped in MT8000:



USB Host

Support various devices with USB interface, such as mouse, keyboard, USB stick, printer…etc.

Ethernet Port

Connected with devices with Ethernet communication function, such as PLC, laptop…etc; exchange the information via Network.

44 Pin IDE Interface

Enlarge the available hard disk to store a variety of data or information.

Compact Flash card

Support the download/ upload of a project, including recipe transfer, Event Log Data…etc.

Serial I/O Port

COM ports, RS-232, RS485-2w/4w, can be connected to PLC or other peripheral devices. Here we view RS-422 the same as RS-485 (4 wire). Please refer to the appendix in the user manual for correct connection of PLC and touch screen. Besides, please make sure all dipswitches are on “OFF” (down) position (defaults of the display).

In addition, Weintek provides aaa and bbb connection cables to expand a COM port to multiple independent COM ports so that the efficiency of the operation will be improved. Please refer to the connection illustration in the manual.

3. MT8000 System Settings

Before first operating MT8000, users have to complete every system setting. After the setup, use EB80000 editing software to develop a personal operation interface.

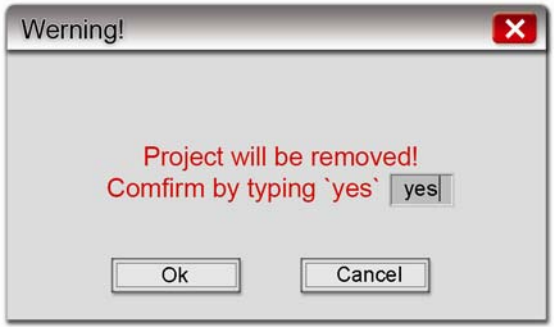
The following illustrates every system setting respectively.

(1)System Reset

Each HMI is equipped with a set of reset button and dip switch. When using Dip switch to change different modes, corresponding functions will be triggered. (Please refer to related chapters.)

If losing or forgetting system passwords, users can set Dip Switch 1 to “ON” position, the rest of Dips remain on “OFF” position and then reboot MT8000.Under this situation, MT8000 will jump to Touch Adjust (Touch screen calibration) mode. After calibration, the pop-up window appears as the illustration below. Users will be inquired if restoring the system password to the default value.

When “YES” is chosen, another pop-up dialog appears as below. Users will be confirmed again if restoring the system password to the default value and will be asked to input “YES”. Then click OK. (The default password is 111111. However, other passwords, including download and upload password, have to be reset.)



Note: When the reset action is be taken, projects and saved data in the HMI will all be cleared.

(2) Tool bar

After activating the HMI, users can set the system by using the tool bar at the bottom of the screen. Normally, tool bar is hidden automatically. Only touch the target at the cornet of the right-bottom will the tool bar pop up.

1) Large Keyboard

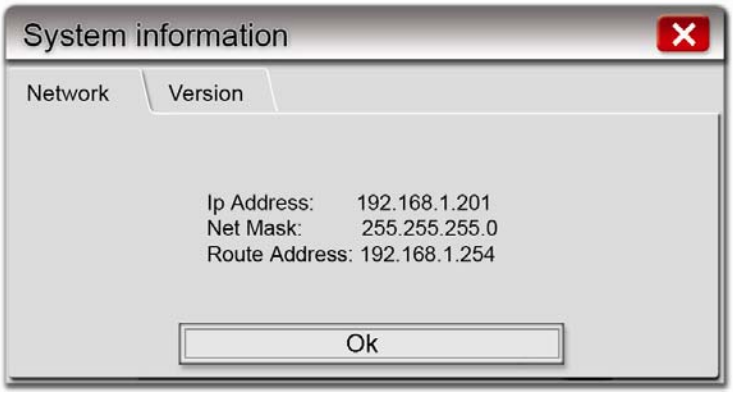
Use large keyboard to input the text information.

2) Small Keyboard

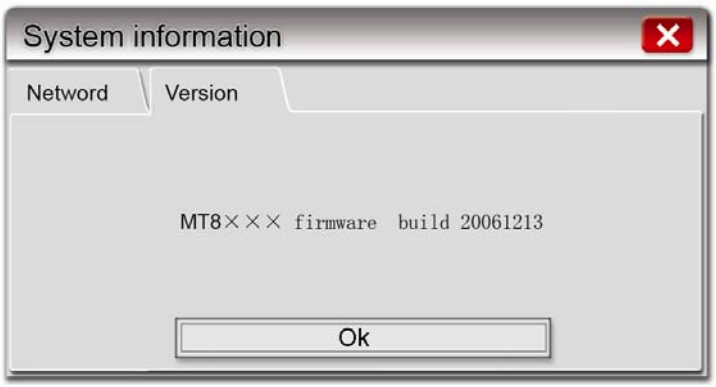
Use small keyboard to input the numerical information.

3) System Information

Network: Display Network information, including IP address of HMI and other network information.



Version: Display information of the system version.

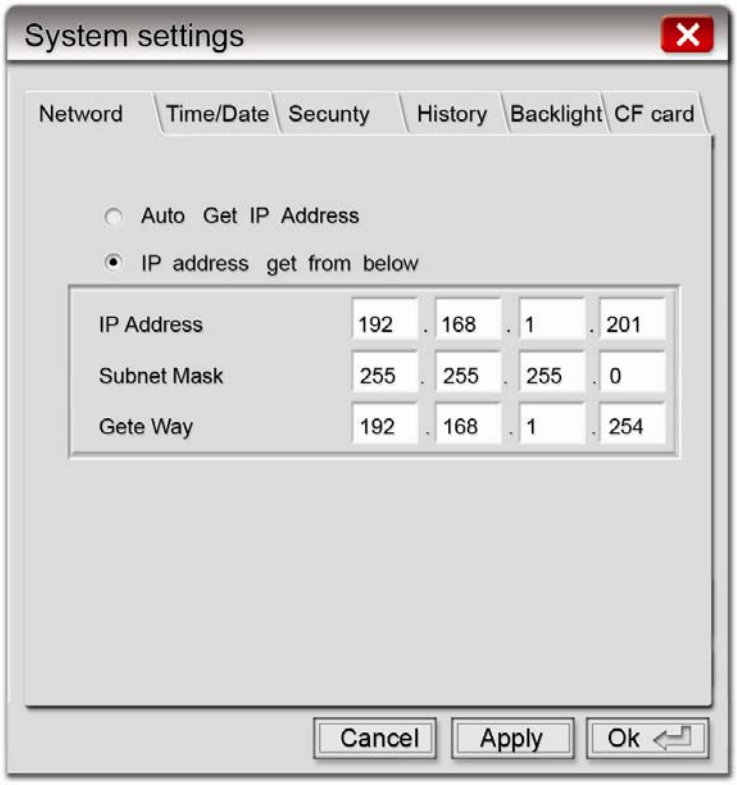


4) System Setting

Set or modify system parameters. Password has to be confirmed in view of security.

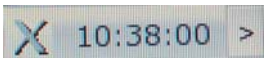
a. Network

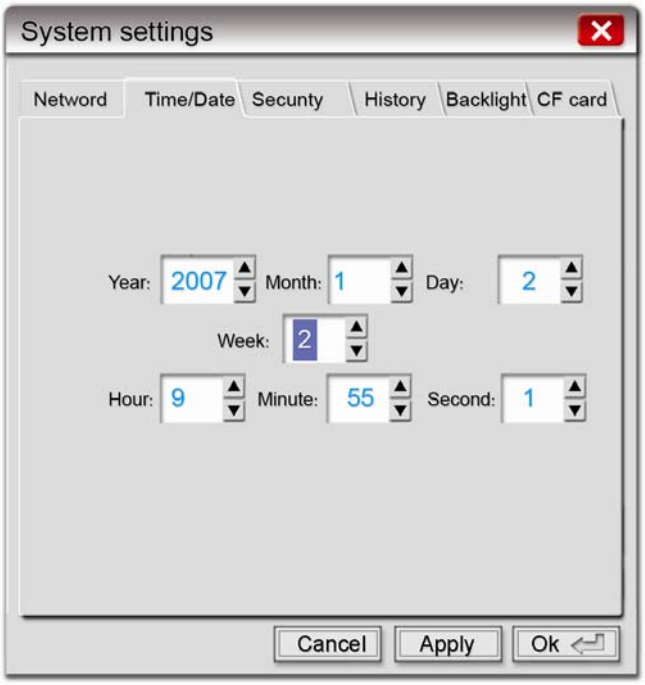
Projects can be downloaded to MT8000 via Ethernet so that the IP address of operation target (HMI) must be correctly set. If “Auto Get IP Address” is selected, IP address will be automatically assigned from local DHCP network. While if “IP address get from below” is selected, IP address and other network information have to be input.



b. Time/Date

System time/date will display at the cornet of the bottom-right after the adjustment.





c. Security

Providing stricter security protection for the MT8000. The default of the password is 111111.

Local Password
Password to enter the system

Upload Password
Password to upload the project

Download Password
Password to download the project

Reserved Password
Password reserved for further usage

Password confirmation:

d. History

The tab can clear the historical data in the HIM: Recipe, Event log and Data log.

e. Backlight

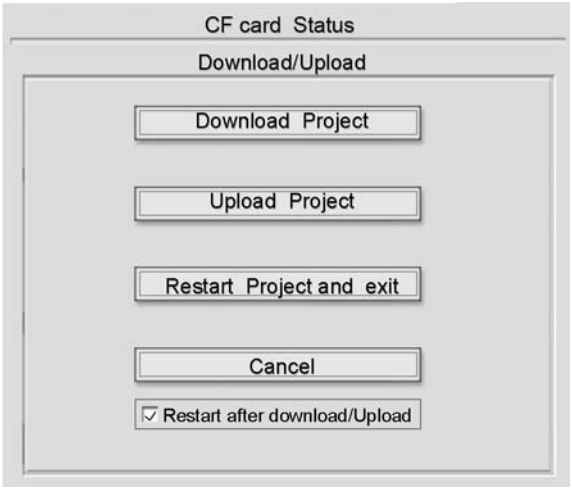
Using the rolling bottom on the screen to adjust the brightness of LCD.

f. CF Card Stat

When HMI detects other new device, this function will be enabled.

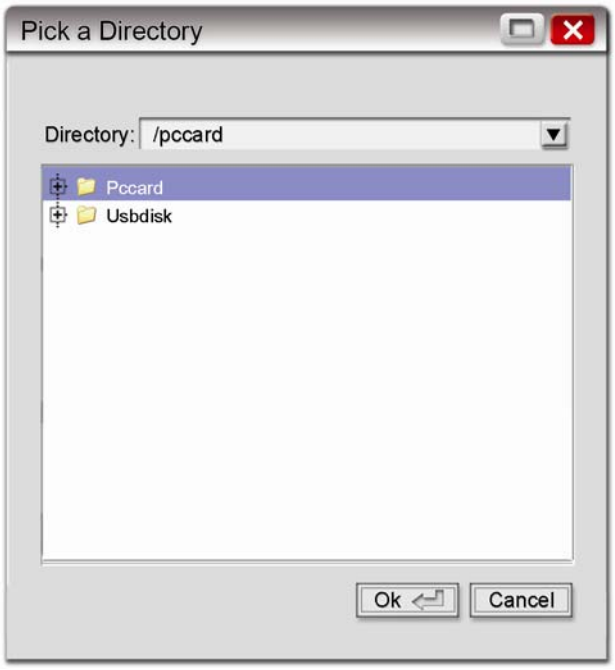
4. MT8000 Download Setting Screen

MT8000 provides two methods: CF card and USB stick, to download a project to HMI. After insert CF card or USB stick and assign the directory name, all context under the directory will be downloaded to the HMI. When HMI detects new peripheral devices, the following screen appears:



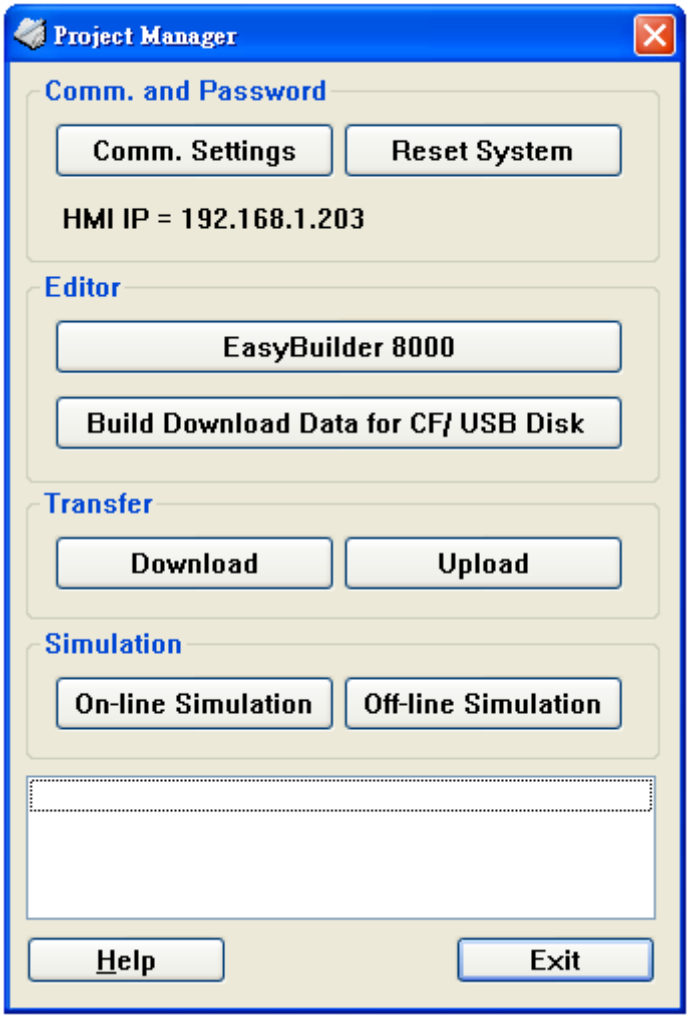
Several functions can be selected at this time and some need the confirmation of the password. Please refer to the illustration below:

After the confirmation of the password, directory names of the CF card…etc will be displayed. (pccard: CF Card ; usbdisk: usb device)



Select the download path and click OK for downloading.

Note: Data to be downloaded will be created from [Build Download Data for CF/USB Disk] of Project Manager.



Generally speaking, Project Manager divides the downloaded files into two directories:

MT8000

store projects

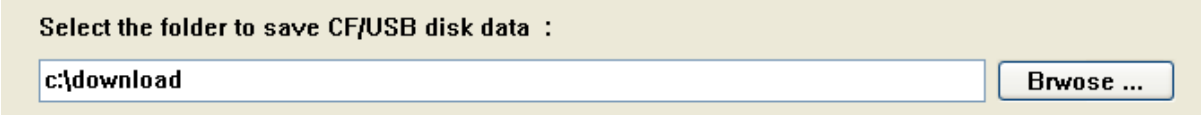
History

The directory will be created when download the historical data.

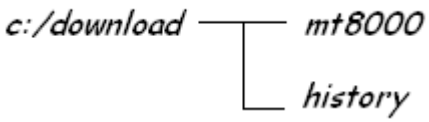
mt8000

history

In other words, if location of the saved file as below,

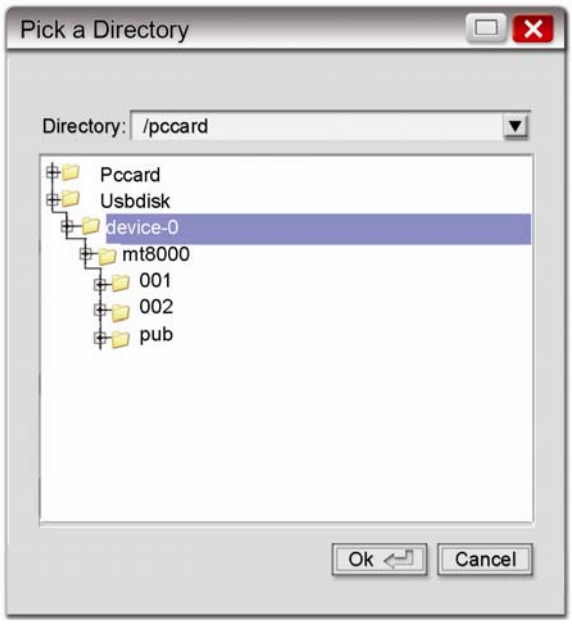


the data structure will as follows:

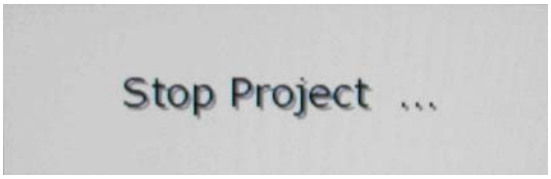


The most upper path should be selected when downloading. In other words, take the structure above as an example, download must be selected but mt8000 or history is invalid.

Take the illustration below as another example, usb disk only saves mt8000 directory but not includes history. In this case, users must choose device-0 to correctly download the file.



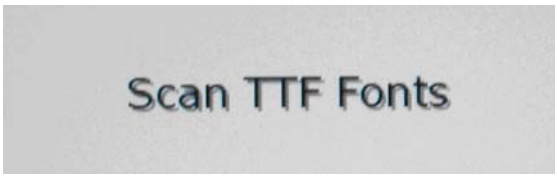
In the process of downloading, screens of HMI change in order:



Stop the current project

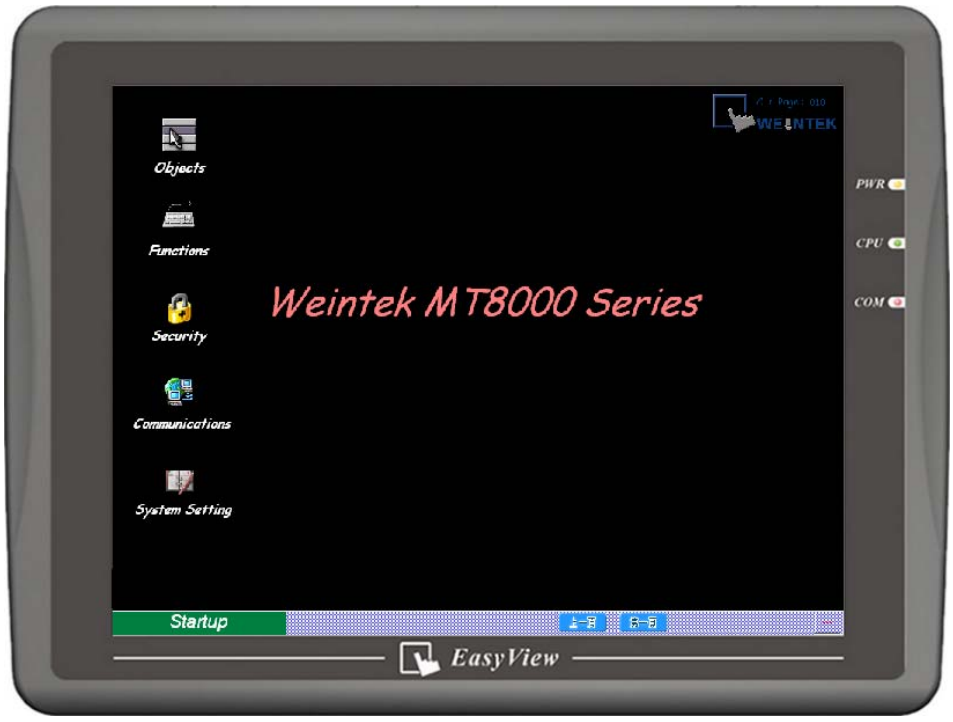
Start to download a new project

Activate the new project



Scan font file

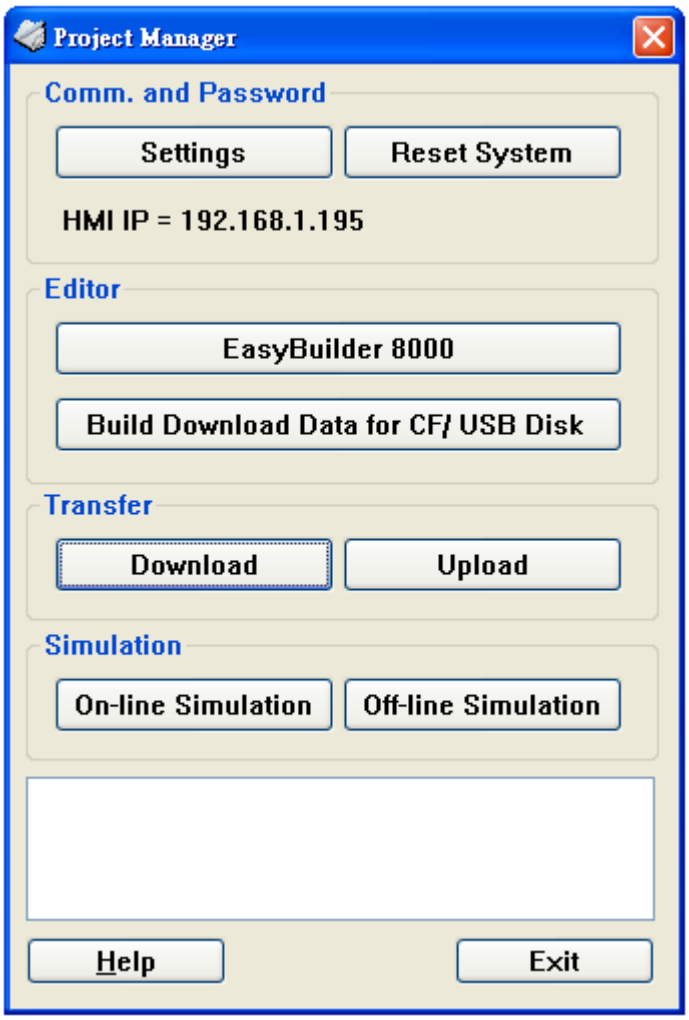
The screen appears as below after a successful new project downloading.



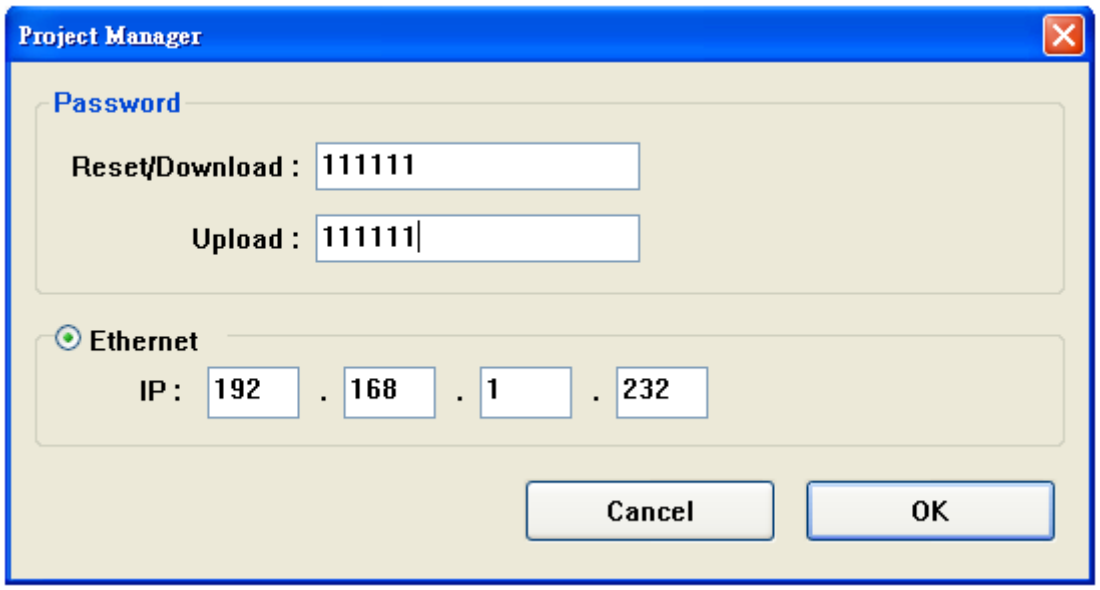
Chapter 2 Project Manager Operations

Introduction

Project Manager integrates every available function of the EB8000. Each function will be introduced in this chapter.



A. Settings



Operating MT8000 by Ethernet needs to designate correct IP address and necessary password. “Download” and “Reset” functions share a set of password while “Upload” function uses another password. Please refer to the related chapters about how to modify or view the IP address and password.

B. Reset System

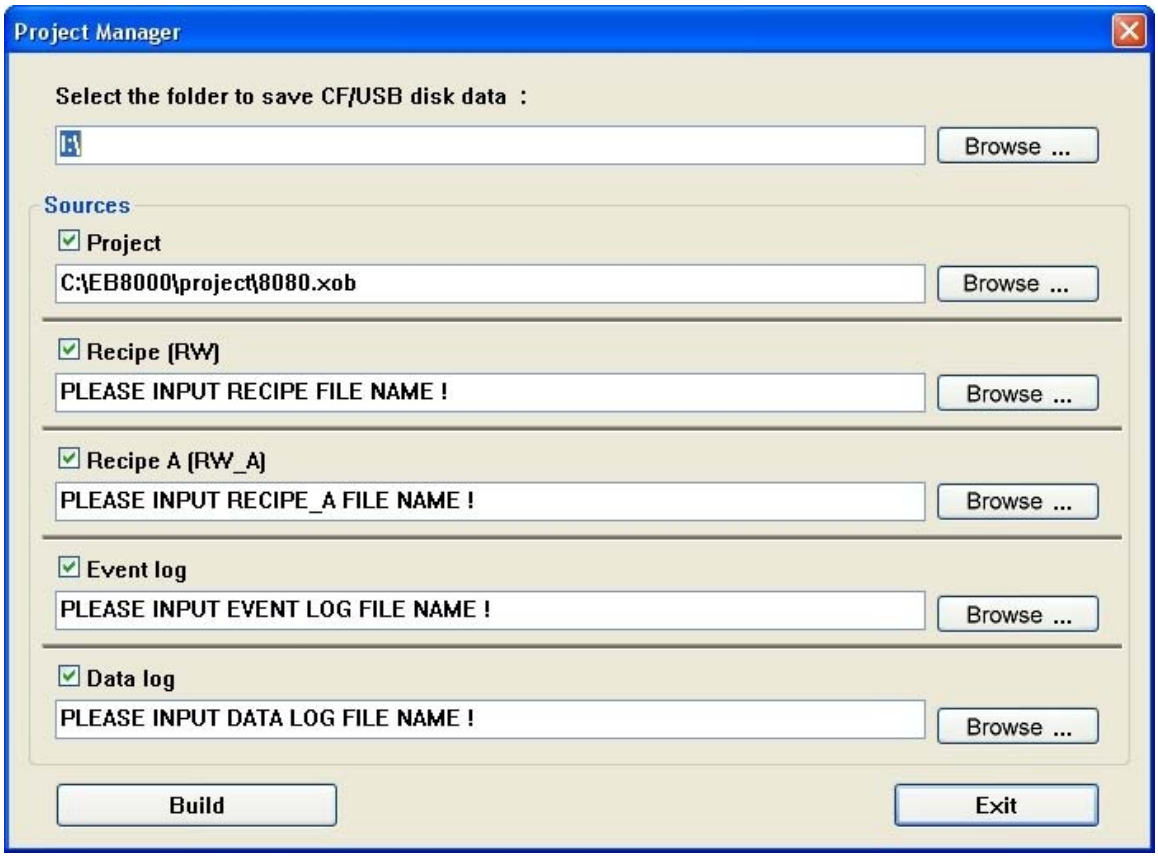
Under certain situation, users need to reset the system, such as updating the internal files of HMI. This function can be executed without restart the system.

C. EasyBuilder 8000

Activate EasyBuilder 8000 graphical editor.

D. Building Download Data from CF Card/USB Stick

Except Ethernet, data also can be downloaded to the MT8000 by CF card or USB memory stick. The function is for building the download data and the settings shows as below.



[Select the folder to save CF/USB memory stick data]

Press [Browse] to search for and assign the file path (or directory name) and then press [Build] to set all contexts of the downloaded data. Users can directly designate the save location in CF card/ USB stick or copy the entire directory to CF card/USB stick after completely building the data.

Insert CF card or USB stick and assign the name of the file, EB8000 will start downloading the whole content of the file to HMI.

Note: Save location should be the name of directory and avoid designating only root directory.

For example, both c:\" and f:\\" are illegal names.

[Project]

Use EB8000 to configure the context of display (*.mtp file) and then compile it to *xob file for HMI terminal. The desired *xob file for CF card can be selected by using this function.

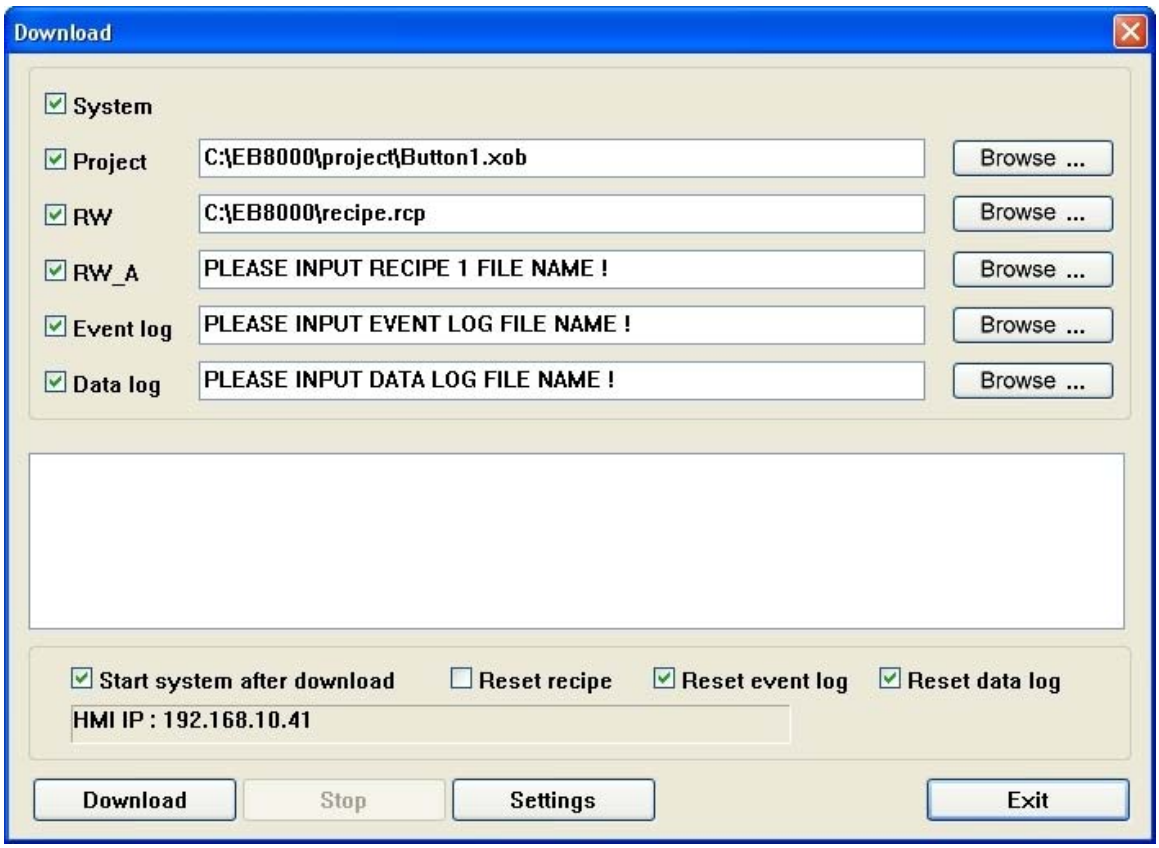
[Recipe (RW)]
RW Recipe file for CF card can be selected by this function. The max effective size of the file is 64K. Please refer to “Receipt Transfer” for more details.

[Recipe A (RW_A)]
RW_A Recipe file for CF card can be selected by this function. The max effective size of the file is 64K. Please refer to “Receipt Transfer” for more details.

[Event log]
Event log file for CF card can be selected by this function. Please refer to “event log object” for more details.

[Data log]
Data log file for CF card can be selected by this function. Please refer to “data log object” for more details.

E. Download
Downloading files to the MT8000 through Ethernet. Press the [Download] button and the dialog appears as below:



[System]
Check [System] to update all of the kernel programs of HMI.

[Project]
EB8000 are able to have the content of screen configuration (MTP file) compiled and get *.xob file for MT8000.The desired *.xob file downloaded to the terminal can be selected.

[RW]
Select the desired RW recipe data to be downloaded to MT8000. The max size available is 64K Please refer to [recipe transfer] chapter for further information.

[RW_A]
Select the desired RW_A recipe data to be downloaded to MT8000. The max size available is 64K. Please refer to [recipe transfer] chapter for further information.

[Event log]

Select the desired event log file to be downloaded to MT8000. Please refer to “Event log object” for more details.

[Data log]
Select the desired data log file to be downloaded to MT8000. Please refer to “Data log object” for more details.

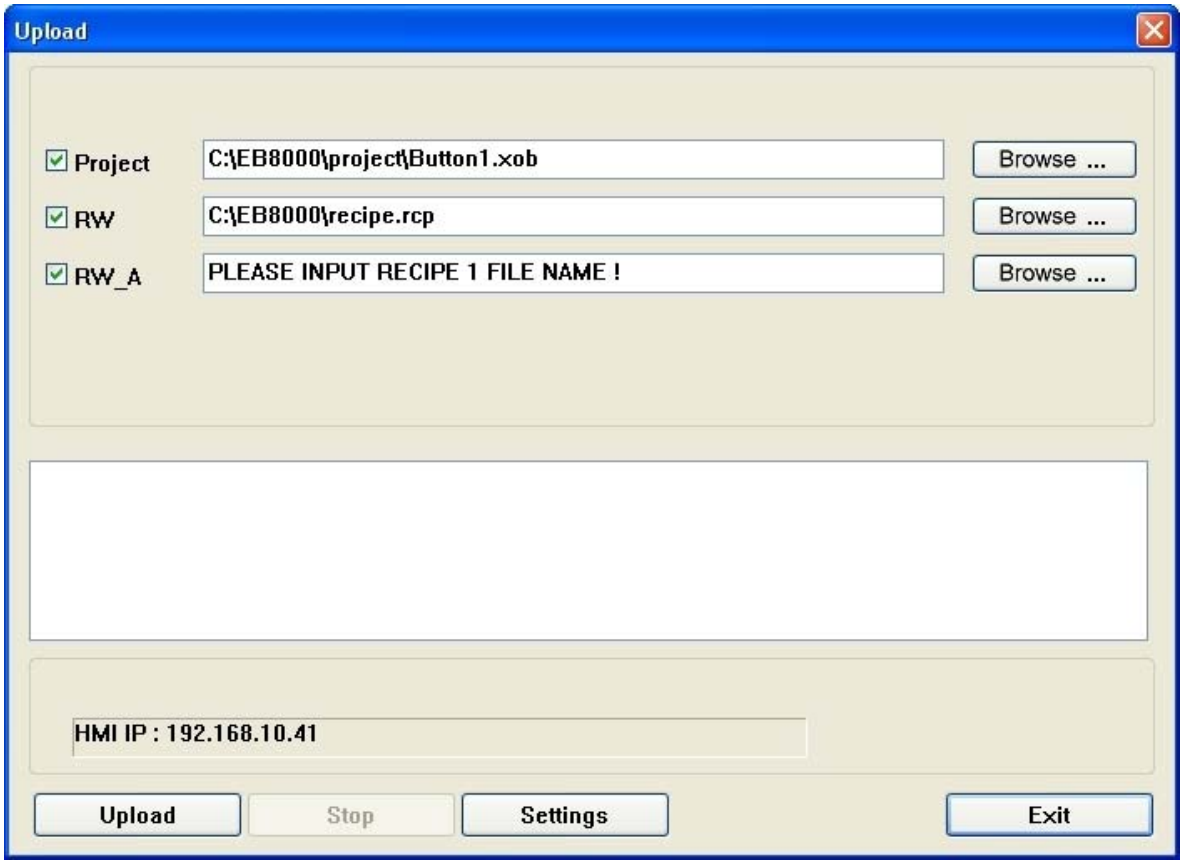
[Reset recipe]
Check [Reset recipe] to set all figures of recipe to 0 before the process of downloading.

[Reset event log]
Check [Reset Event log] to clear all of the event log files in HMI before the process of downloading.

[Reset data log]
Check [Reset data log] to clear all of the data log files in HMI before the process of downloading.

F. Upload

Uploading files to MT8000 by Ethernet and the dialog box shows as below:



[Project]

Select *.xob save location after uploading.

[RW]

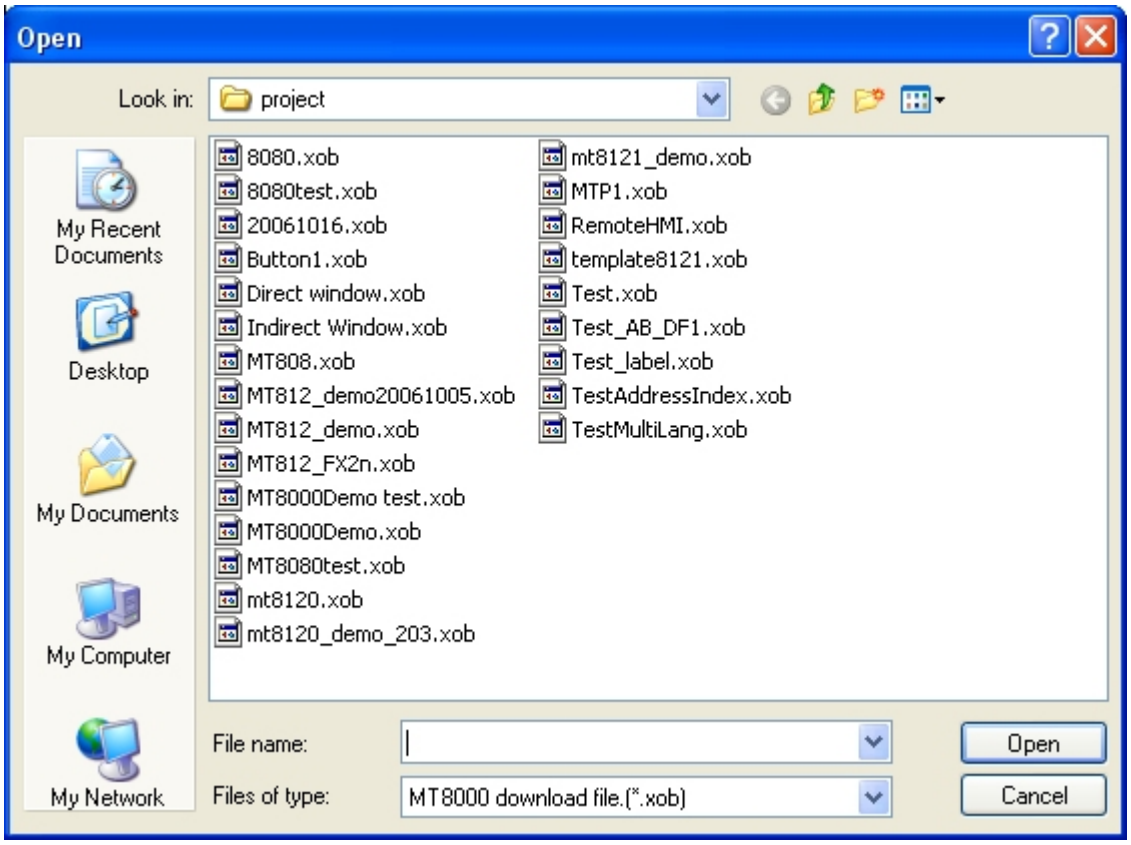
Select RW save location after uploading.

[RW_A]

Select RW_A save location after uploading.

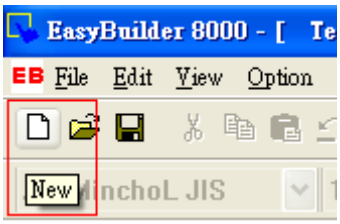
G. On-line Simulation/Off-line Simulation

Execute On-line/Off-line Simulation. Select the source of *.xob file before executing the function as follows:

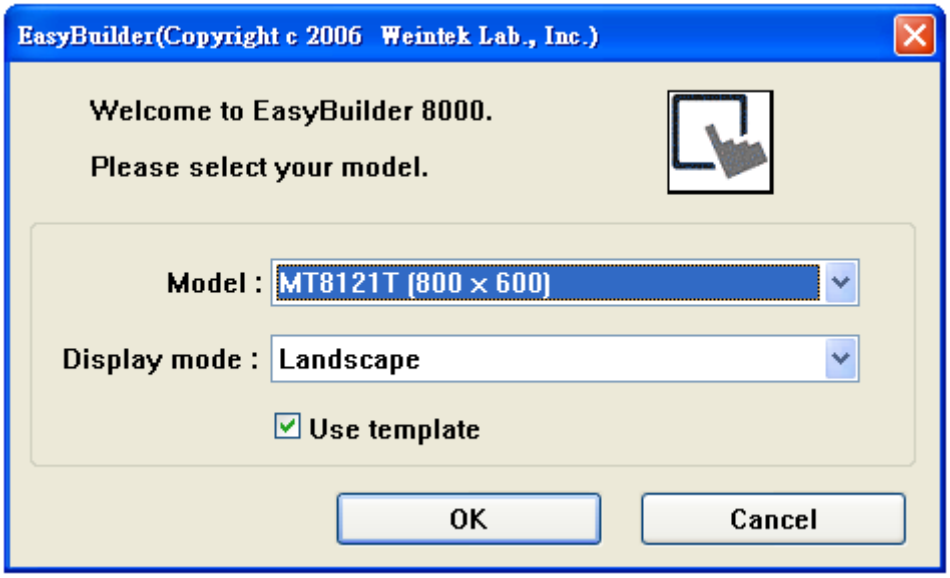

Open
Look in:
project
My Recent Documents
Desktop
My Documents
My Computer
My Network
8080.xob
8080test.xob
20061016.xob
Button1.xob
Direct window.xob
Indirect Window.xob
MT808.xob
MT812_demo20061005.xob
MT812_demo.xob
MT812_FX2n.xob
MT8000Demo test.xob
MT8000Demo.xob
MT8080test.xob
mt8120.xob
mt8120_demo_203.xob
mt8121_demo.xob
MTP1.xob
RemoteHMI.xob
template8121.xob
Test.xob
Test_AB_DF1.xob
Test_label.xob
TestAddressIndex.xob
TestMultiLang.xob
File name:
Files of type:
MT8000 download file.(*.xob)
Open
Cancel

Chapter 3　How to Create a Simple Object

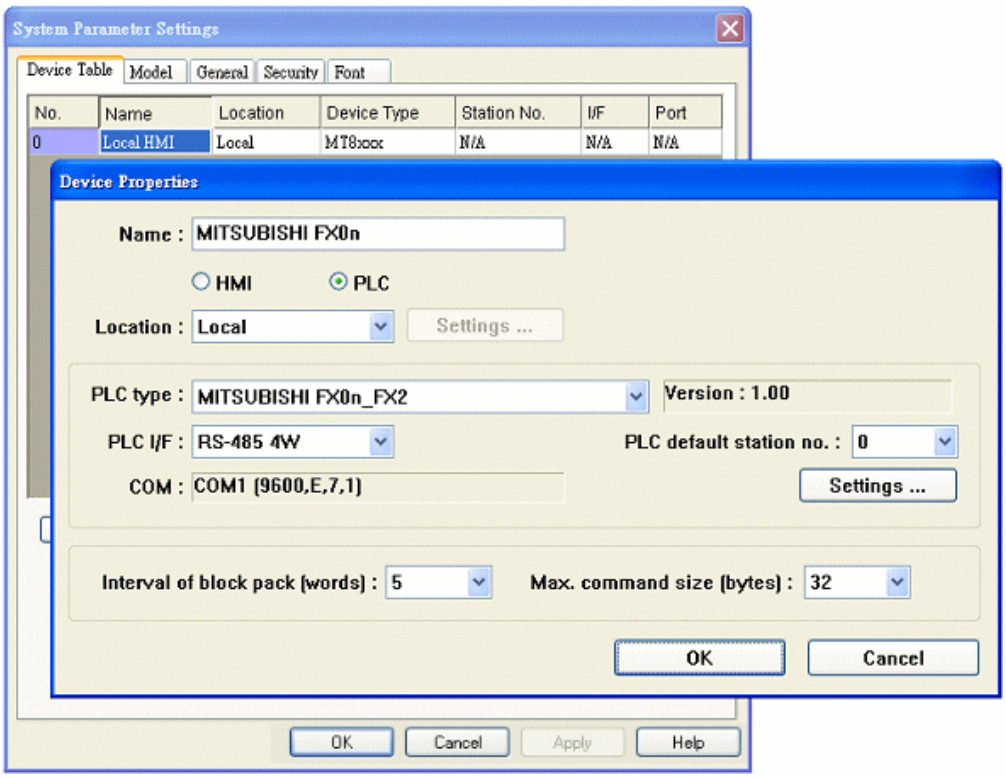
The following takes MITSUBISHI PLC as an example to illustrate how to create a simple project. First of all, click [New] icon on the toolbar to create a new blank project as below:



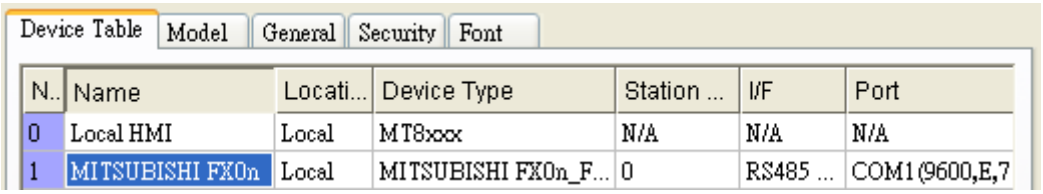
Select HMI Model and Display mode and then click OK.



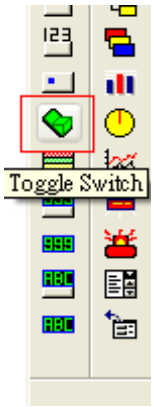
Except correctly setting the system parameters, click [New…] function on Device Table to add a new device. The settings are as below:



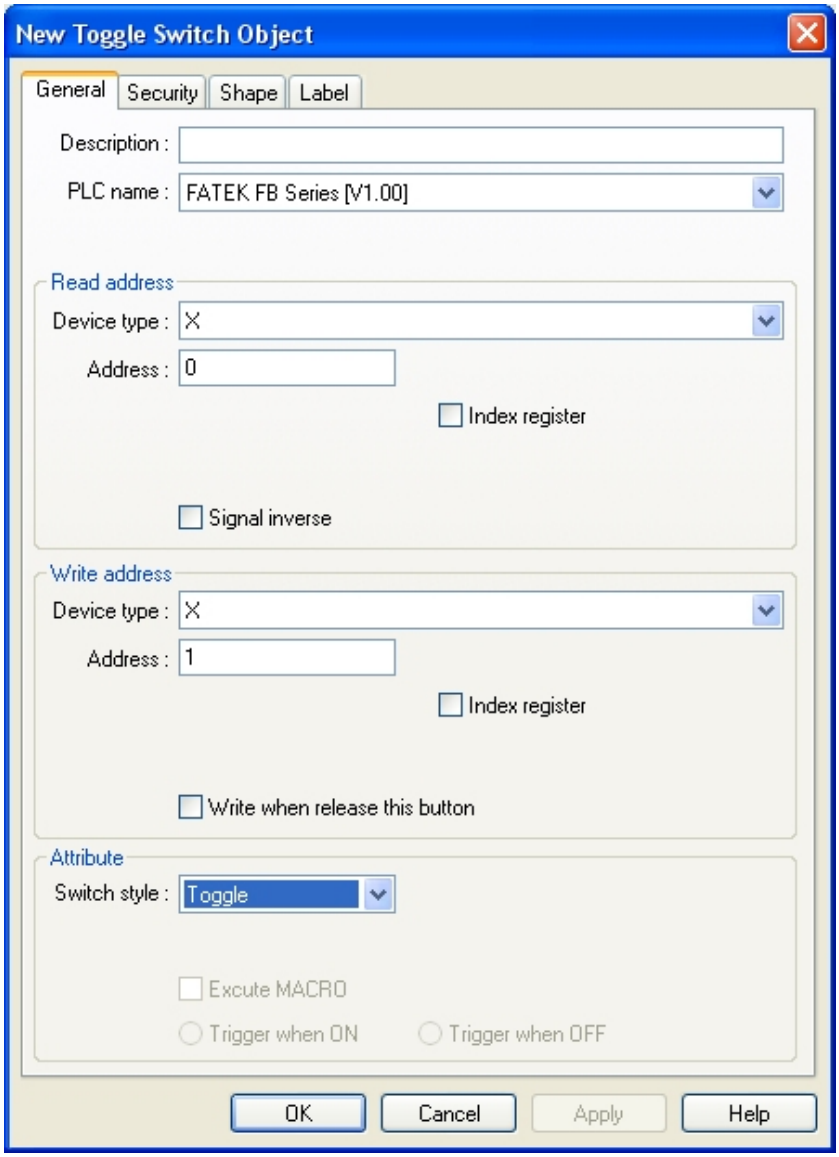
Device “MISUBISHI FX0n” is added to the Device Table after click OK.



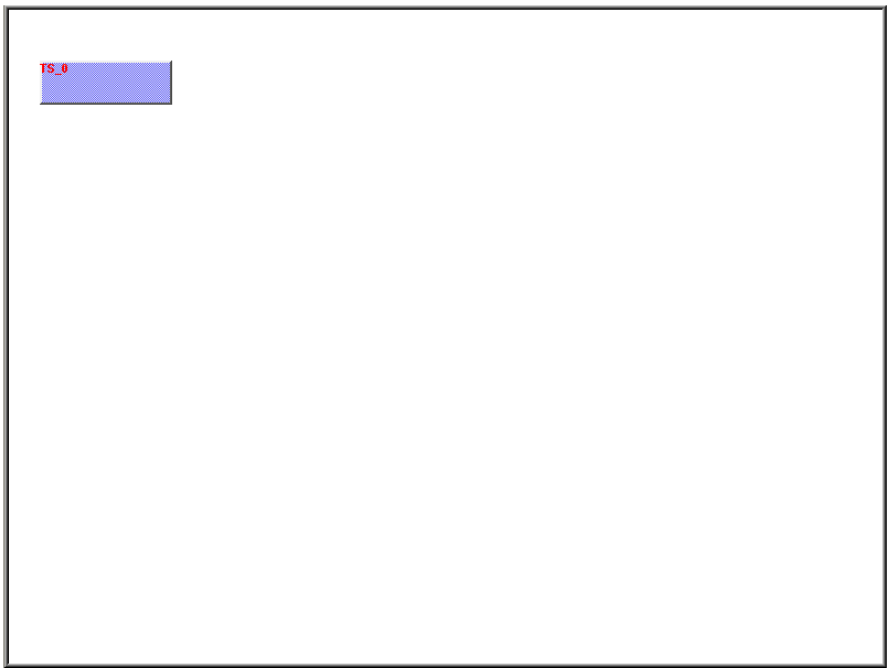
If a toggle switch would like to be added, click the object buttons showed as follow.



New Toggle Switch Object dialog appears as the illustration. After correct settings of each property, click OK and put the object to the desired place.



Finished window 10 is as below and a simple project is completed.

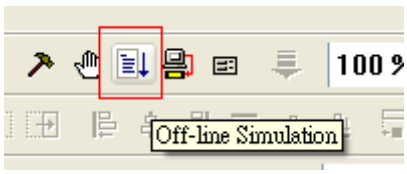


After the file is saved, users select [Compile] function icon to examine if the screen configuration is correct.

If the compiling result shows as below which means no error exists, then click the icon to execute the Off-line Simulation.

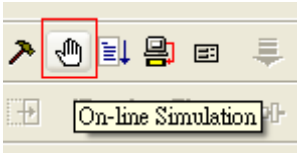
0 error

Object size : 1934 bytes
Library size : 130620 bytes
Font size : 0 bytes
Total size : 132566 bytes



The following screen is the screen after executing the off-line simulation:

If On-line Simulation needs to be done, click the icon for processing after connecting the device.



Chapter 4 Compiling, Simulation and Downloading

A complete design procedure includes: screen configuration, compiling, simulating and downloading.

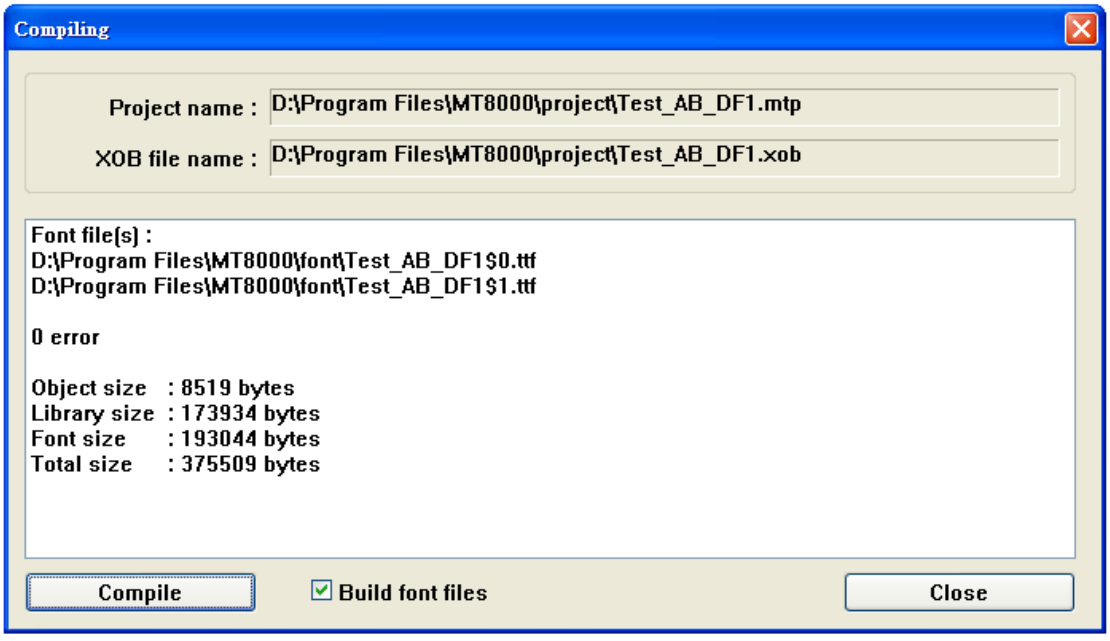
Every step is introduced in this chapter.

1. **Screen Configuration**

   Varied screens can be configured by the EB8000 and the edited context is saved as a *.mtp file.

2. **Compiling**

   After screen configuration (*.mtp file), transfer *.mtp file to *.xob format for MT8000 downloading by using compiling function. Click icon on tool bar and [Compiling] dialog appears as below:



In [Compiling] dialog, [Project name] indicates the name of current configuration file while [XOB file name] indicates the name of compiled file.

Check [Build font files] will re-build a new font file when compiling every time. If no change in the text context of an object (including the font), cancel this function so as to accelerate the compiling. Click [Compile] and the following information displays on [Compiling] dialog:

Font Files
The font files for displayed text which will be downloaded to the MT8000.

Object Size
The size of the compiled file

Library Size
The size of shape library and picture library
Font Size
The total size of font files.

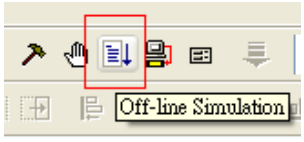
Message “0 error” means a successful compiling and then other simulation functions can be continued. If an error exists, users should follow instructions to correct errors.

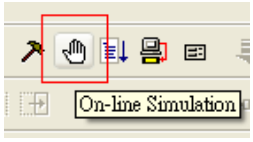
3. Simulation

There are two simulations: Off-line simulation & On-line simulation. By virtual device, PC simulates the operations of PLC without connecting to PLC. On the contrary, On-line simulation is executed by connecting with PLC and accurately setting the communication parameters. When simulating on PC, if the control target is a local PLC (i.e. the PLC directly connected to PC), there’s a 10 mins simulation limit.

Users can find Off-line simulation and On-line simulation functions from two ways:

A) Project Manager

B) Clicking 

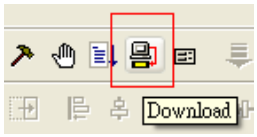
, 

icons from tool bar of the EB8000.

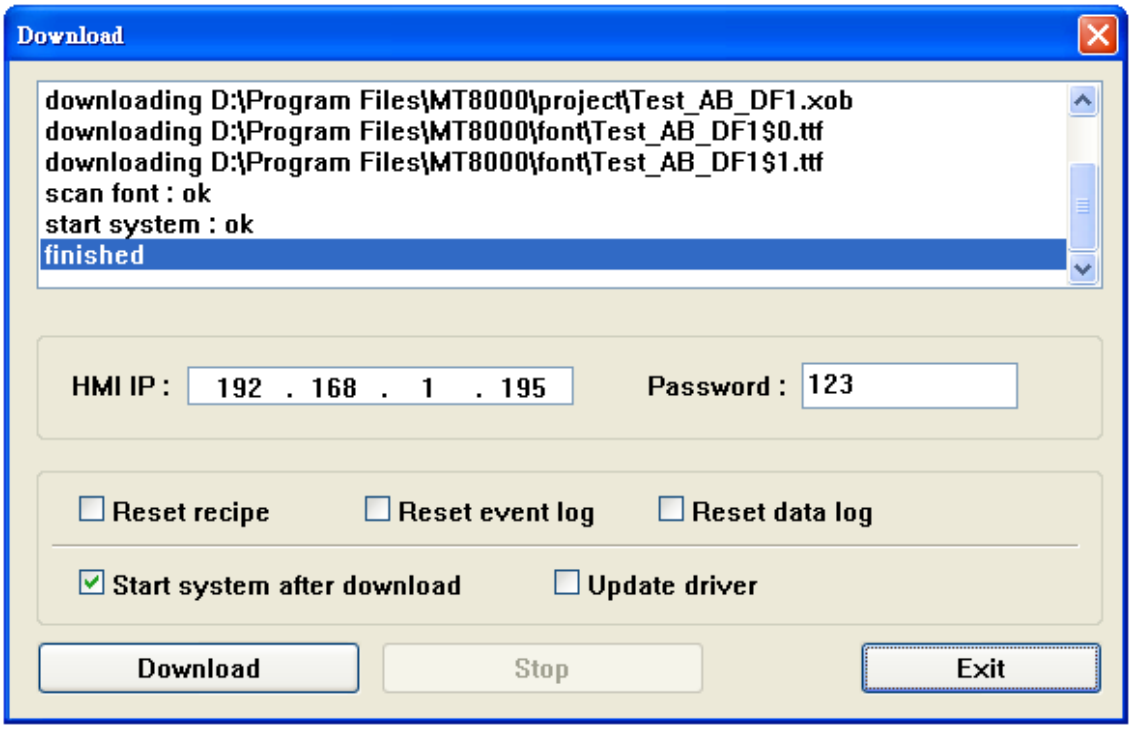
4. Downloading

After the completion of the simulation and the confirmation of the screen configuration, next step is to download *.xob file to MT8000. Downloading *.xob file can be done by:

A) [Download] function from Project Manager. Please refer to" Project Manager" related chapters.

B) Click 

icon from tool bar of the EB8000 and [Download] dialog appears as below:



[Download] dialog settings:

[HMI IP]

Assign the download target IP

[Password]

Input password. Please refer to the "hardware setting" related chapter.

[Reset recipe]

If the function is selected, all recipe figures will be set to 0 before downloading.

[Reset event log]
If the function is selected, all event log files saved in the MT8000 will be cleared before downloading.

[Reset data log]
If the function is selected, all data log files saved in the MT8000 will be cleared before downloading.

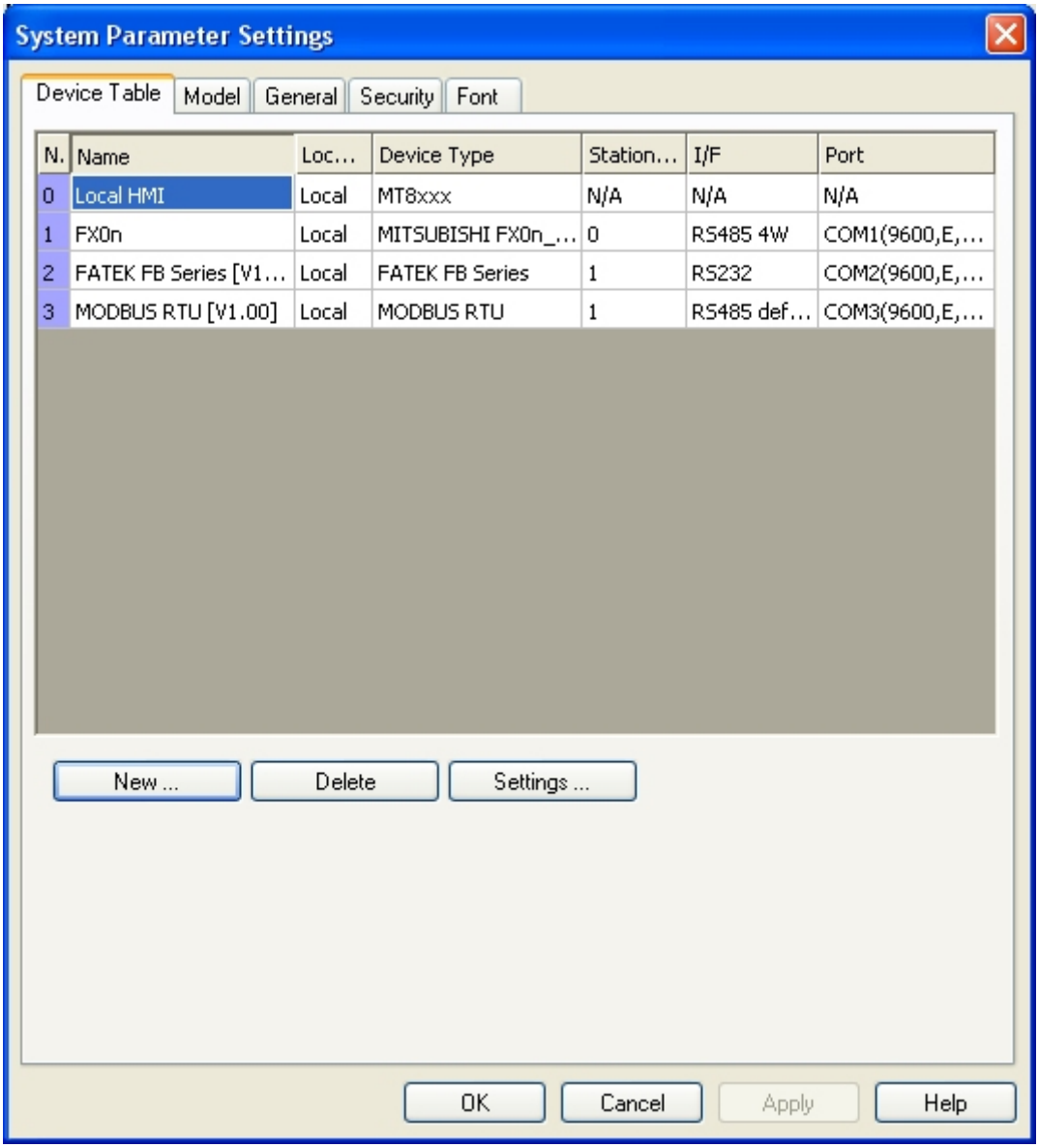
[Start system after download]
If the function is selected, MT8000 reboots after downloading is done.

[Update Drivers]
If the function is selected, PLC drivers will be updated. Under the circumstances of remaining PLC types unchanged, cancel this function to shorten the downloading time.

Click [Download] to execute downloading operation. Downloaded files will display on the message dialog.

Chapter 5 System Parameters

In the EB8000, select menu [Edit]/[System Parameters…] and the system parameter setting dialog appears as follows:

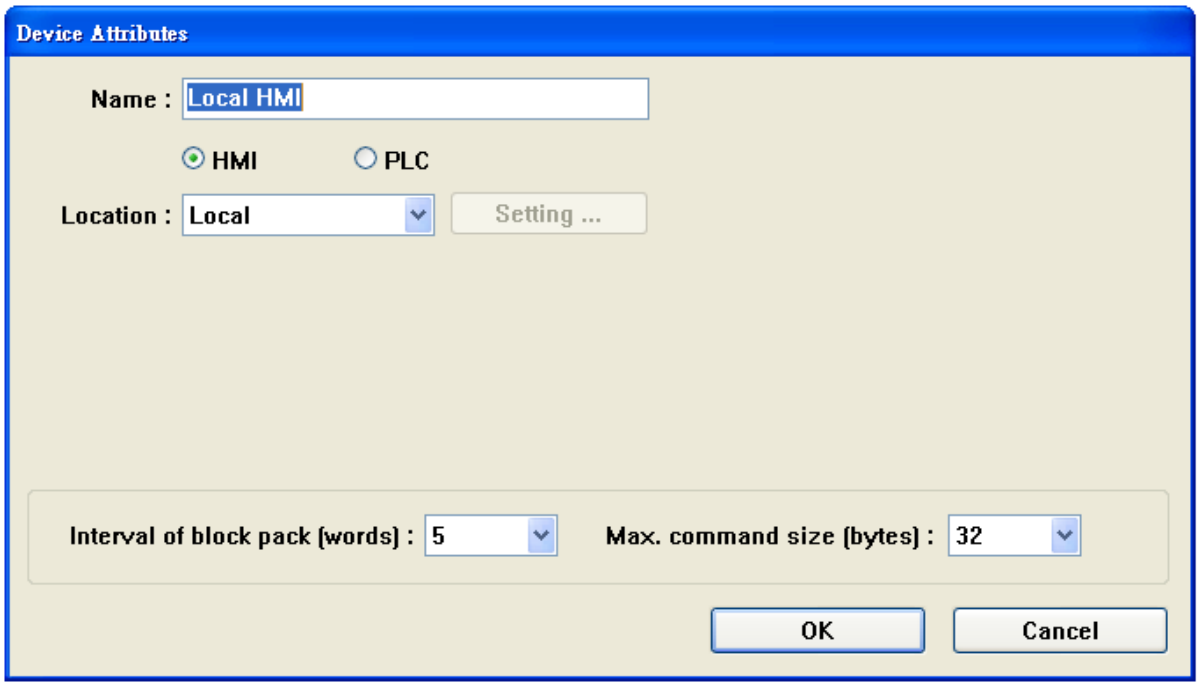


System parameters are divided into five parts: [Device Table], [Model], [General], [Security] and [Font] which are introduced respectively in this chapter.

1. [Device Table]

[Device Table] parameters determine all of the characteristics of each device controlled by a HMI. These devices include PLC, remote HMI and PC. When open a new *.mtp file, a default device: “Local HMI” is in the table. “Local HMI” is used to identify current HMI .Each *.mtp should at least include a “Local HMI” device.

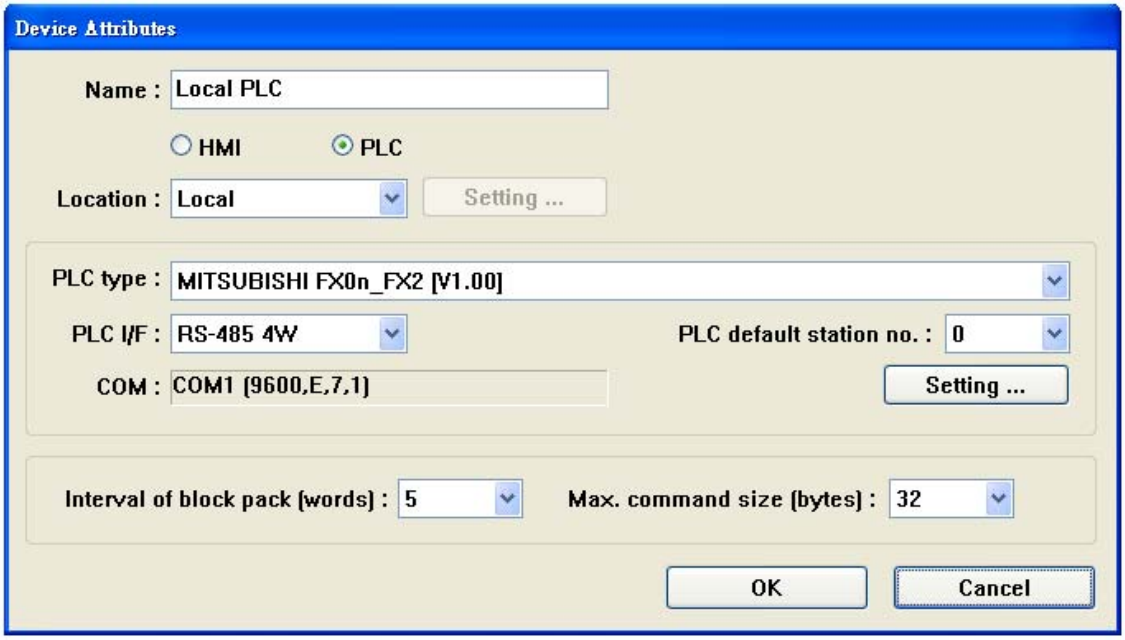
Click [Settings…] to open [Local HMI] dialog box. From the illustration below, the property of local HMI is “HMI” and the location is “Local”.



The procedure to create a new device:

(1) How to control a local PLC

So-called “local PLC” means a PLC is directly connected to local HMI. To control a local PLC should add this type of device. Click [New…] and the following [Device Properties] dialog appears. Correctly fill in all of the properties as required.



Each setting is introduced as follows based on the example above.

[Name]
The name of the device.

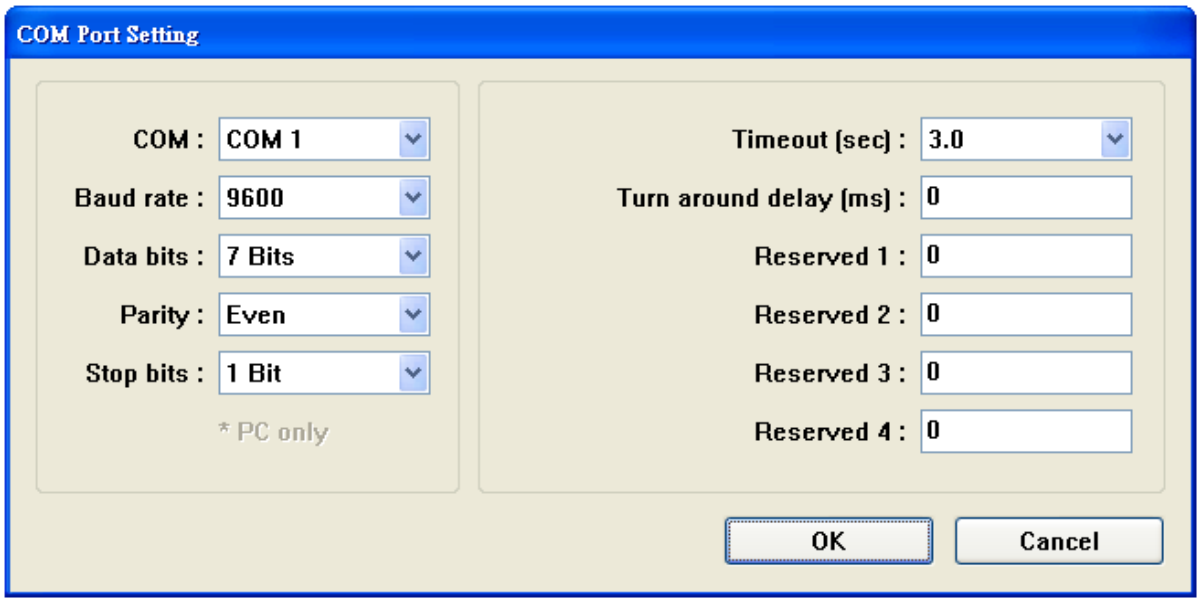
[HMI] or [PLC]
If connecting device is PLC, then select “PLC

[Location]
“Local” or “Remote” can be selected. Select “Local” in this example.

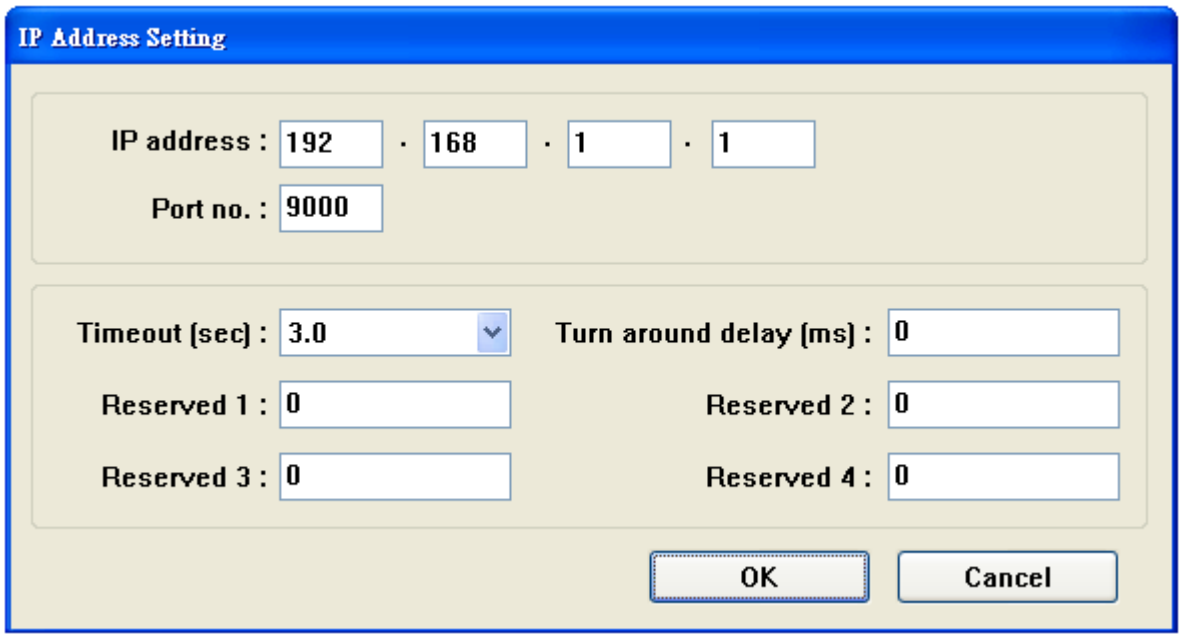
[PLC Type]
Select the type of PLC.

[PLC I/F]
Four PLC interfaces are available:”RS-232”, “RS-485 2W”, “RS232-485 4W”, and “Ethernet”.

If the interface is “RS-232”, “RS-485 2W”or “RS232-485 4W”, click [Setting…] and [Com port setting] dialog appears as below. User should correctly set the communication parameters.



If the interface is “Ethernet”, click [Setting…] and then [IP Address Setting] dialog appears. Users should correctly set IP address and Port No. of the PLC.



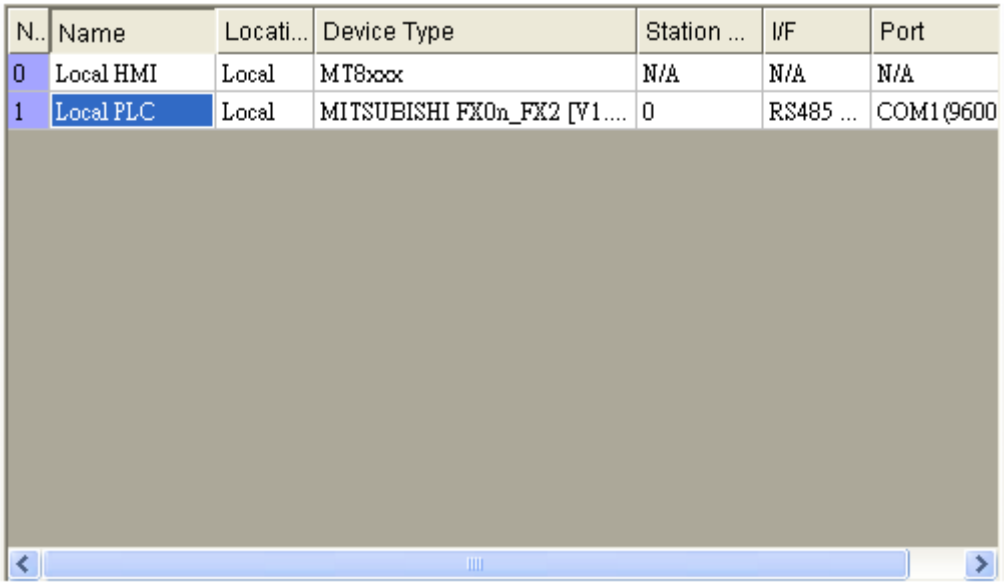
[PLC default station no.]
Number of PLC station.

[Interval of block pack (words)]

If the value of command to target address is smaller than the value of [Interval of block], several commands can be combined to one command.

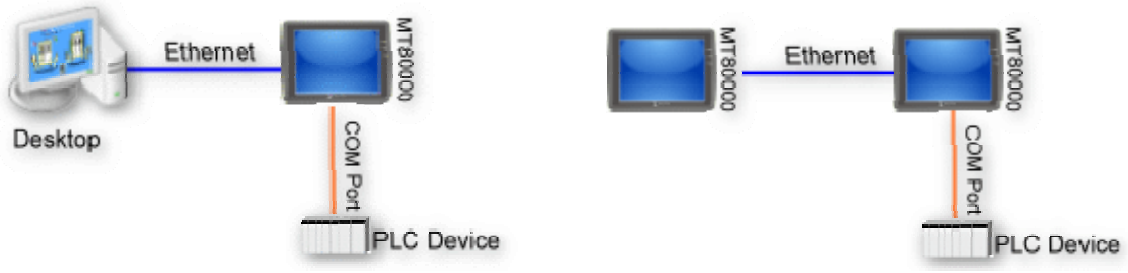
[Max. command size (bytes)]
The maximum size (bytes) of the command can be sent to the device.

After every setting, a new name “Local PLC” device can be found on the table.

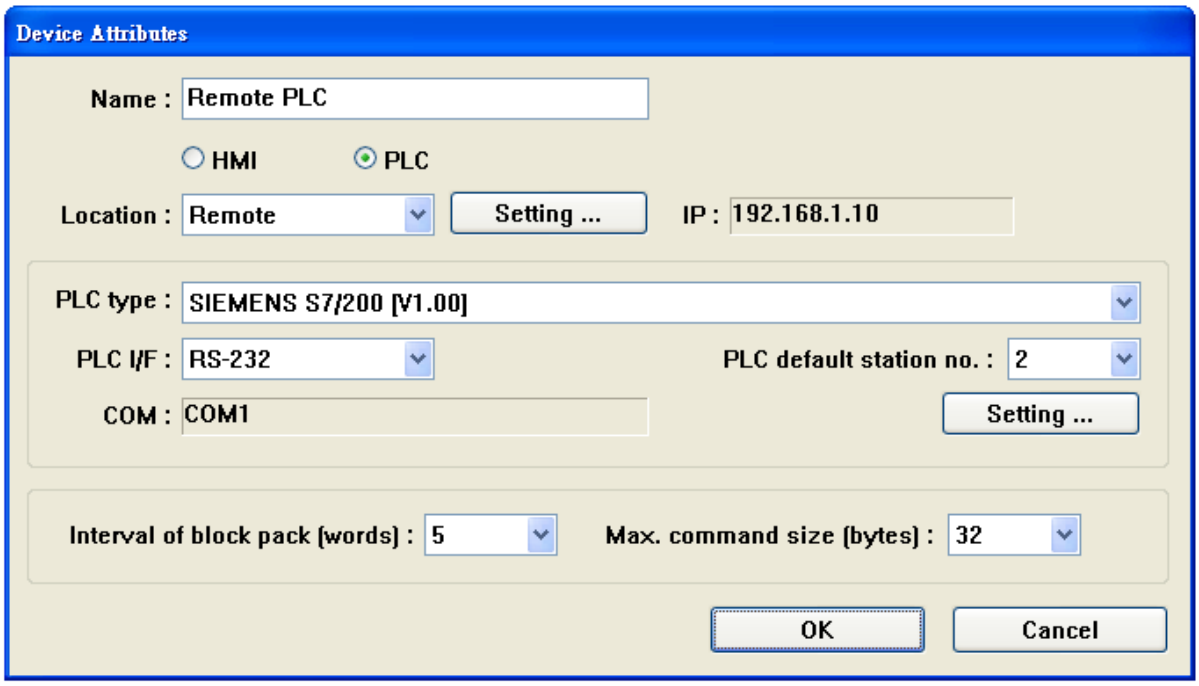


N..	Name	Locati...	Device Type	Station ...	I/F	Port
0	Local HMI	Local	MT8xxx	N/A	N/A	N/A
1	Local PLC	Local	MITSUBISHI FX0n_FX2 [V1....	0	RS485 ...	COM1 (9600

(2) How to control a remote PLC



So-called “remote PLC” means a PLC is directly connected to a remote HMI. To control a remote PLC should add this type of device. Click [New…] and the following [Device Properties] dialog appears. Correctly fill in all of the properties as required.



Each setting is introduced as follows based on the example above.

[Name]
The name of the device.

[HMI] or PLC]
If connecting device is PLC, then select “PLC”

[Location]
“Local” or “Remote” can be selected. Select “Remote” in this case and set the address of the remote HMI. Select [Location]/ [Setting…] to set the IP address of the remote HMI.

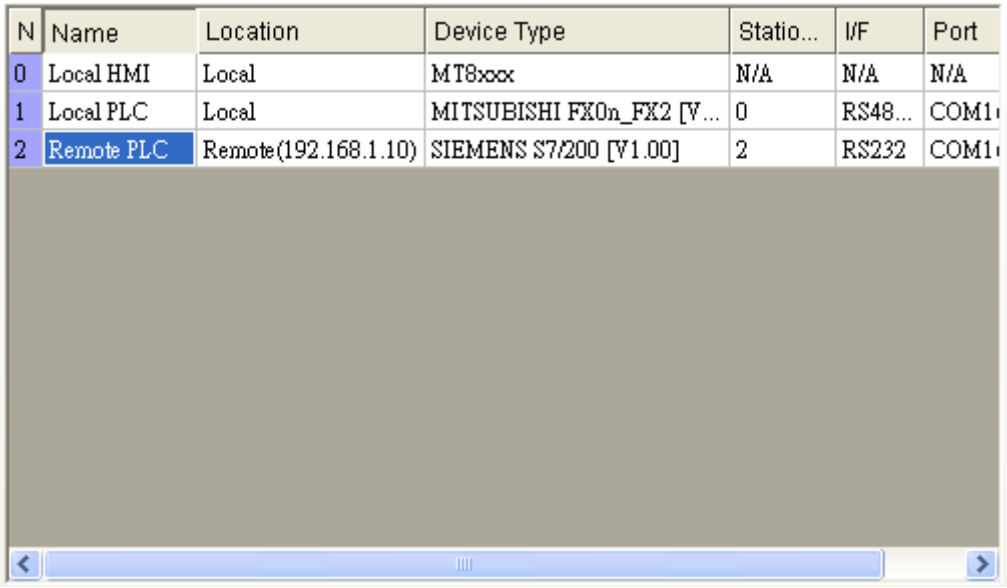
[PLC Type]
Select the type of PLC

[PLC I/F]
The type of interface for remote PLC. If COM port is used by remote PLC, interface ”RS-232”, “RS-485 2W” or “RS232-485 4W” can be selected.

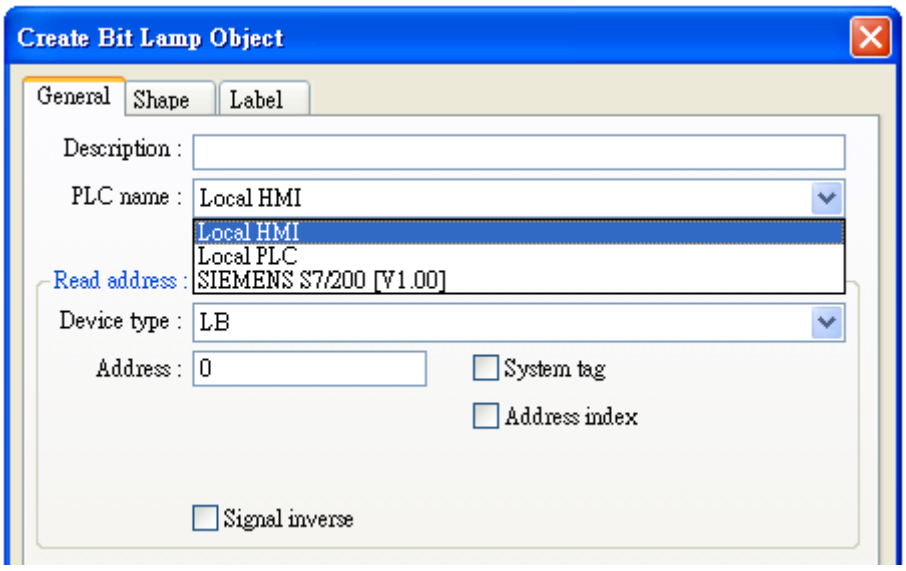
[PLC default station no.]
The No. of PLC station.

[COM]
The COM port used by a remote PLC. The parameters should be correctly set.

After every setting, a new name “Remote PLC” device can be found in the table.

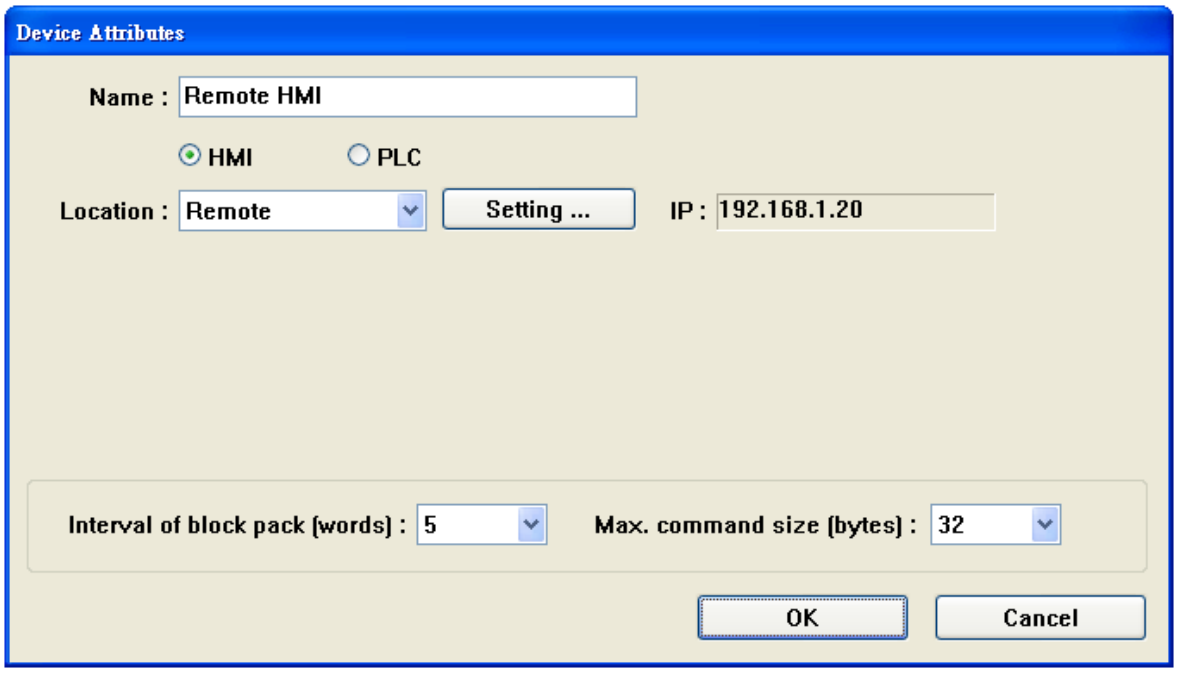


Select assigned device from the table to operate the specific content of PLC address.



(3) How to control a remote HMI

So-called “remote HMI” means a non-local HMI. PC also can be viewed as one kind of remote HMI. To control a remote HMI should add this type of device. Click [New…] and the following [Device Properties] dialog appears. Correctly fill in all of the properties as required.



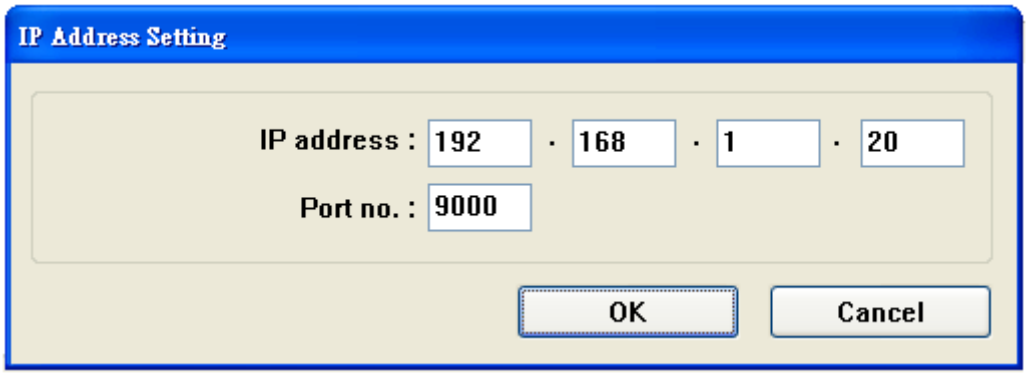
Each setting is introduced as follows based on the example above.

[Name]
The name of the device

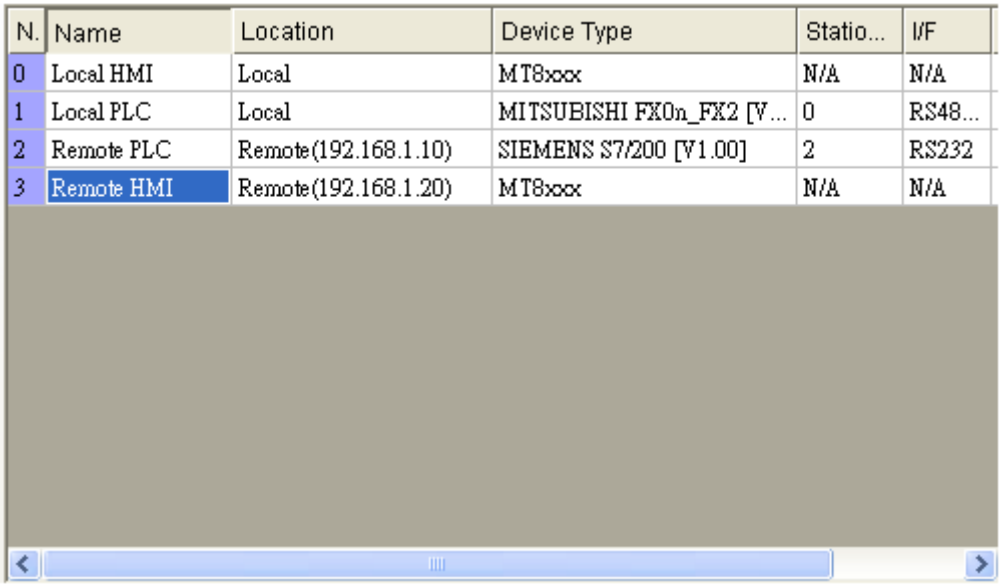
[HMI] or [PLC]
If connecting device is HMI, then select “HMI”

[Location]
“Local” or “Remote” can be selected. Select “Remote” in this case and set the address of the remote HMI. Select [Location]/ [Setting…] to set IP address of

remote HMI and correct [Port no.]. Port no. of the remote HMI can be found from [System parameters]/[Model] in the *.mtp of remote HMI.



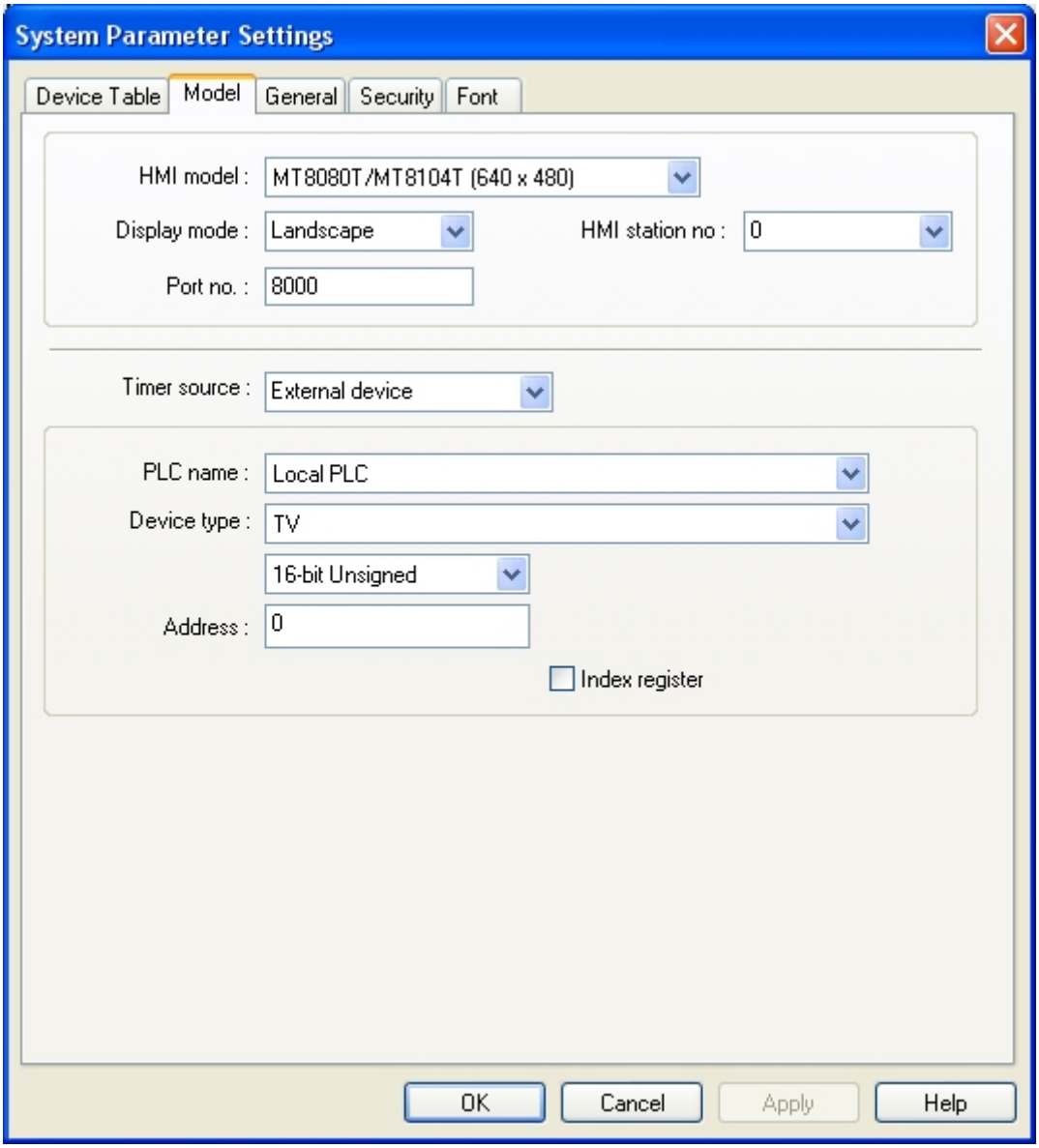
After every setting, a new name “Remote HMI” device can be found in the table.



N.	Name	Location	Device Type	Statio...	I/F
0	Local HMI	Local	MT8xxx	N/A	N/A
1	Local PLC	Local	MITSUBISHI FX0n_FX2 [V...	0	RS48...
2	Remote PLC	Remote(192.168.1.10)	SIEMENS S7/200 [V1.00]	2	RS232
3	Remote HMI	Remote(192.168.1.20)	MT8xxx	N/A	N/A

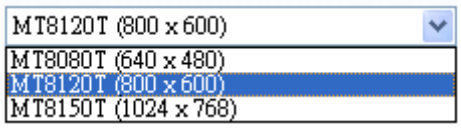
2. [Model]

[Model] tab parameters determine the settings of HMI model, Display mode, Timer source and other communication related settings.



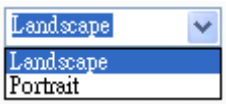
[HMI model]

Select current HMI model as illustration below.



[Display mode]

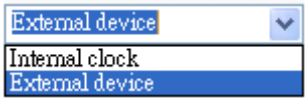
Select the mode of display. “Landscape” is the normal display while “Portrait” is the vertical display.



[HMI station no.]

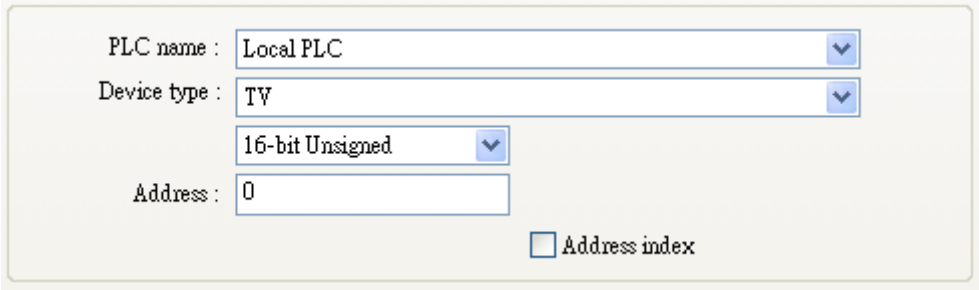
Set the no. of HMI station. If no particular purpose, select default.

[Port no.]
Set the port no. for HMI. If no particular purpose, select default.
[Time source]
Set the source of timer. The time of the timer is used by such as [Data Log], [Event Log] ….etc. objects which needs the time records.



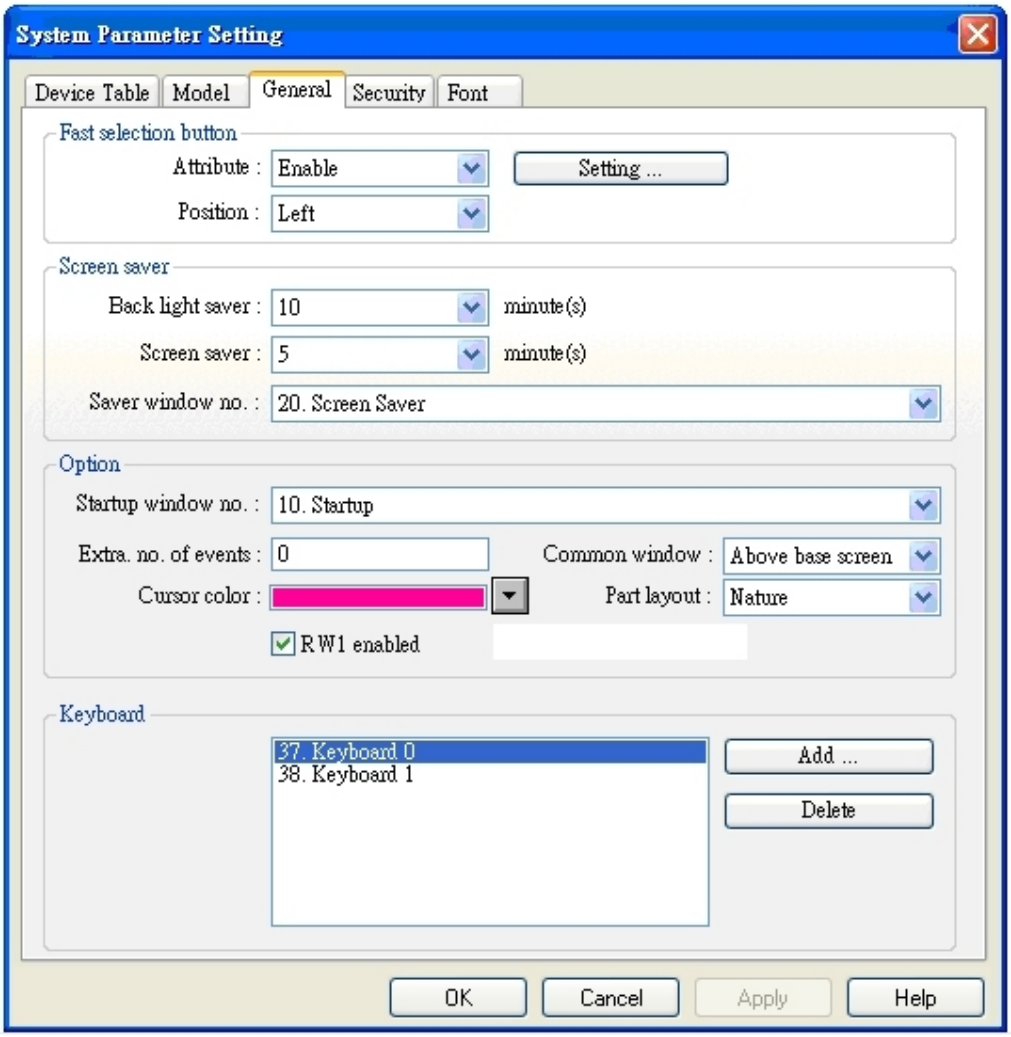
Selecting “Internal clock” demonstrates the time signal comes from internal clock of the HMI.
Selecting “External clock” demonstrates the time signal comes from external device. The correct address source of time signal is necessary in this situation. Take the illustration below as an example. “TV” indicates the time from Local PLC. The contexts of 6 consecutives addresses starting from 0 show as follows:

TV 0 -> Sec.
TV 1 -> Min.
TV 2 -> Hr.
TV 3 -> Day
TV 4 -> Month
TV 5 -> Year



3. [General]

[General] tab parameters determine all properties related to screen operations.

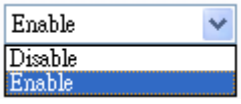


Each setting is introduced as follows:

[Fast selection button]

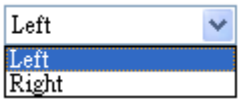
The settings of all attributes for Fast selection window which is designated as window number 4.

- [Attribute]



Enable or disable a Fast Selection window. After selecting “Enable”, click [Setting…] to set the personality attributes of the buttons including color and text.

- [Position]



Select the location of the Fast select button. If “Left” is chosen, the button will show up at the corner of the left-bottom. If “Right” is chosen, the button will show up at the corner of the right-bottom.

[Screen saver]

- [Back light saver]

  If the untouched duration of screen is equal to this value, back light shuts off. The setting unit is minute. Back light is triggered once the screen is touched.

- [Screen saver]

  If the untouched duration of screen is equal to this value, the current screen automatically switches to the assigned [Saver window no.].The setting unit is minute. If “none” value is selected, screen saver function is disabled.

- [Saver window no.]

  When executing screen saver function, [Saver window no.] designates the screen to be switched.

[Option]

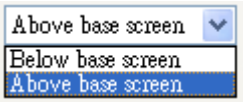
- [Startup window no.]

  Select the window after HMI is started up.

- [Extra no. of event]

  The default of number of events in the system is 1000 in total. If users would like to add more records, the setting value can be modified up to 10000.

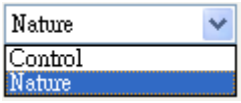
- [Common window]



The objects of the common window (window 6) will be in each base window. This selection determines these objects are placed on or under the objects of the base window.

- [Cursor color]
  Set the color of cursor.

- [Cursor color]



If “Control” mode is selected, when HMI operates, [Animation] and [Moving Shape] display above other kinds of objects and with no relation to the built ranking.

If “Nature” mode is selected, the displayed sequence of objects show according to objects’ built priority.

- [RW1 enabled]
  Enable or disable the recipe data RW1. After activating RW1, an object can operate the content of RW1 .The size of RW1 is 64K.

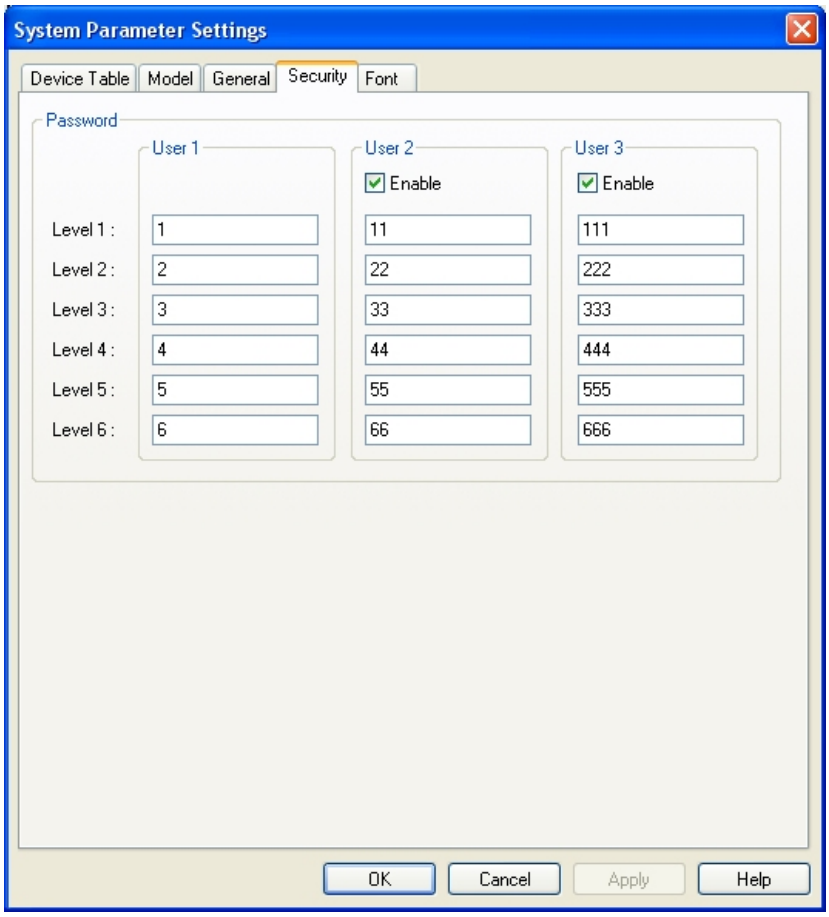
[Keyboard]

[Keyboard] function displays on the screen with keyboard. If these screens represent the use of [Numeric Input] and [ASCII Input], users can select the type of keyboard.

If users would like to build a keyboard, keyboard should be configured on the existing screen and select [Add…] function to add these windows to the table.

4. [Security]

[Security] tab determines the table of user passwords. Three sets of password can be set where “User 2” and “User 3” can be disabled. Only figures are allowed for password.



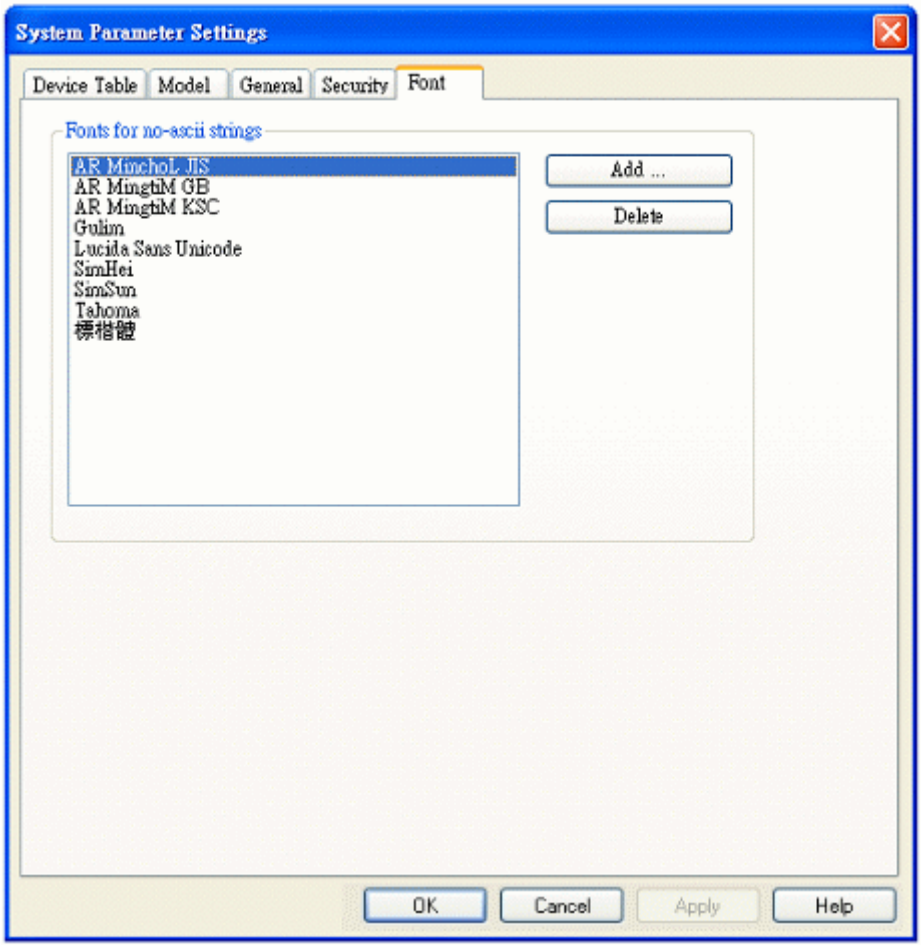
Up to 6 groups of passwords are available for from user 1 to user 3. Level 1 stands for the lowers authority while level 6 stands for the highest authority.

In the procedure of operating the passwords, HMI views the lowest level matching the input password as the current operating level. In other words, if the password of level 2 is “123” and the password of lever 6 is “123”, when a user inputs “123”, HMI will view user’s level as level 2.

Another example: if the password of level 4 of user 1 is “246” and the password of level 2 of user 3 is “246” as well, when a user inputs “246”, HMI will view user 3’s level as level 2.

5. [Font]

[Font] tab determines the font of non-ASCII strings.



[Fonts for non-ASCII strings]

This table lists the fonts for non-ASCII strings. If users use the fonts of non-ASCII strings without choosing the font from [Fonts for non-ascii strings] table, EB8000 will automatically pick up these fonts.

Users can test which non-ASCII strings in the WINDOWS can be used in MT8000 and add them to [Fonts for non-ASCII strings] table.

Chapter 6 Window Operations

A screen is composed of basic element—Window. Users are able to configure 1997 windows or screens. According to function and usage, there are 4 types of windows in the EB8000.

1. Base Window
2. Common Window
3. Fast Selection
4. System Message Window

1. Base Window

Base window is a common type of window.

Except for primary screen, it is used on:

a. Foundation base: used as a background of other windows.
b. Keyboard window.
c. Pop-up window for function key objects.
d. Pop-up window for direct and indirect windows
e. Screen saver

The illustration below is the screen of startup which uses base window.

2. Common Window

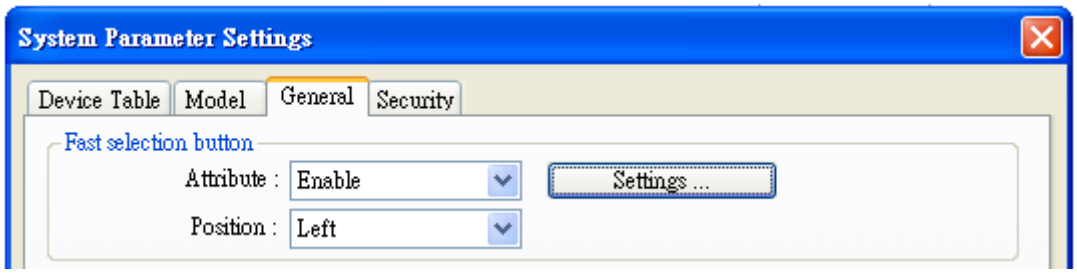
Window 4 is the default of common window. Objects on this window will display on other windows so that users always place the shared objects on common window. When system operates, [Change common window] mode of

the function key can be used to change the source of common window. For example, change the common window from window 4 to window 20.

3. Fast selection window

Window 3 is defined as Fast Selection Window. This window can co-exist with base window. Therefore, generally speaking, it is used by the common-used operation buttons as the picture below:

When using Fast Selection Window, except creating window 3 first, each function of Fast Selection button should be set. The [Startup] on the picture above is the Fast Selection button which is used to change the appearance and the disappearance of the Fast Selection. Every setting of the Fast Selection button is in System Parameter Settings. Please refer to the illustration below.



Except switching the appearance and the disappearance of the Fast Selection by Fast Selection button, system register also provides the following addresses for users who are able to control Fast Selection and Fast Selection button by the operation of the values in the address. Please refer to “system register” for further introduction.

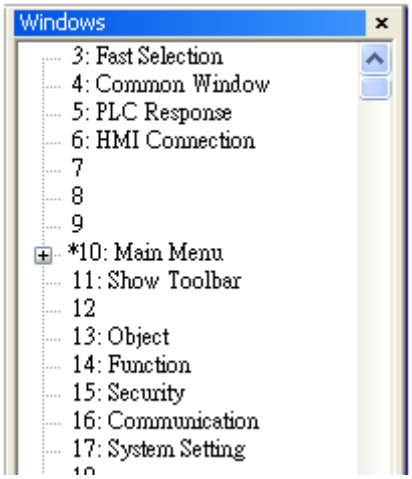
[LB9013] Enable/Disable Fast Selection
[LB9014] Enable/Disable Task button
[LB9015] Enable/Disable Fast Selection/ Task button

4. System Message Window

Window 5 and Window 6 are the defaults of system message window. Among them, Window 5 is the “PLC Response” message window. When the signal of PLC is unreceivable, the message window will pop up automatically. Window 6 is the message window for “HMI Connection”. When connection of remote HMI fails, the message window will pop up automatically.

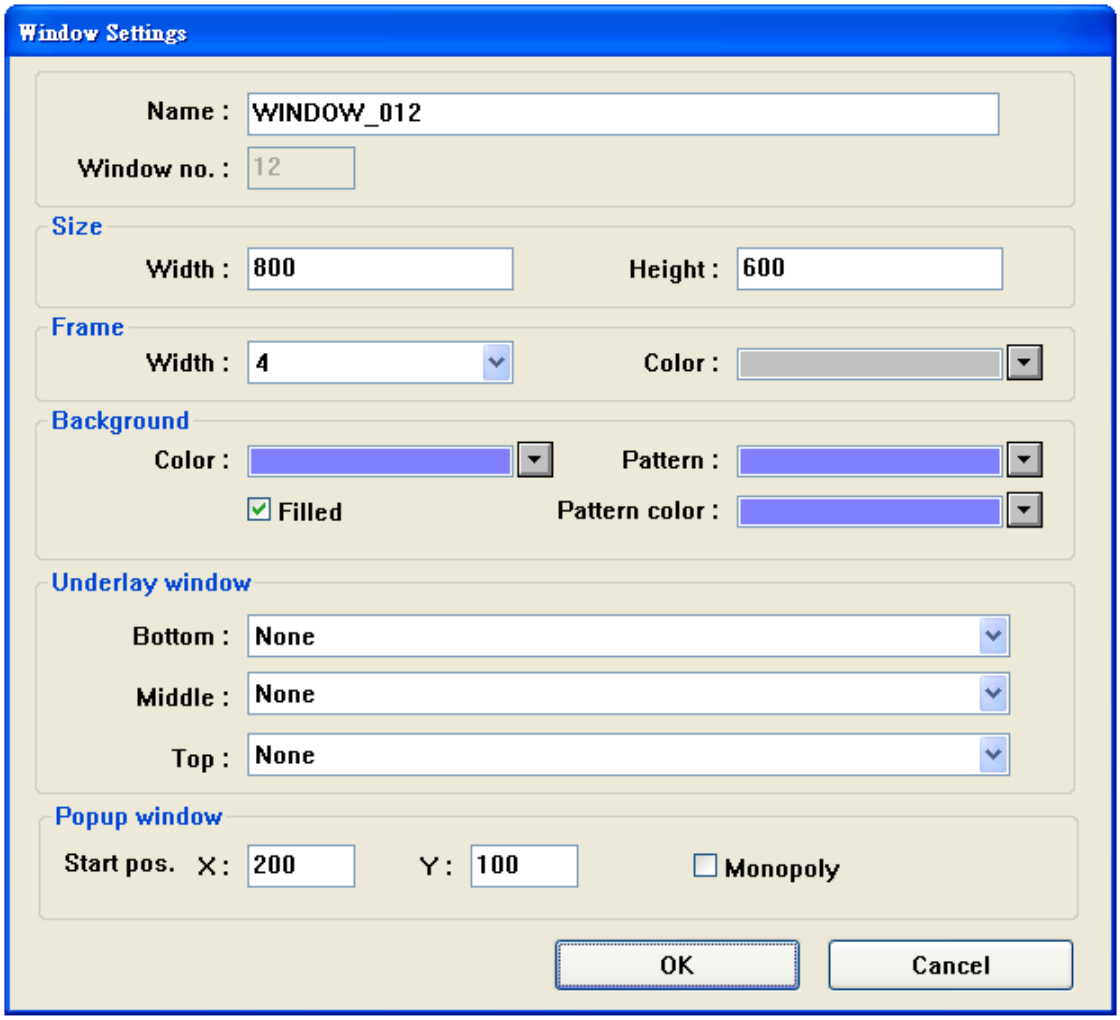
5. Creating, deleting and setting of a window

The picture below displays the window information of the EB8000. The following section introduces how to create and set these windows.



(1) Creating a window

There are two ways to create a window: a) selecting desired window number on the window tree and right click Select [New] on the message dialog and click confirm after the completion of all settings. Please refer to the example below:



[Name]
The name of the window

[Window no.]
The No. of the window, from 3 to 2000.

Size
The [Width] and [Height] of the window.

Frame
[Width]
The [Width] of the frame.

[Color]
The color of the frame.

Background
[Color]
The color of the background.

[Pattern]
The design of the background.

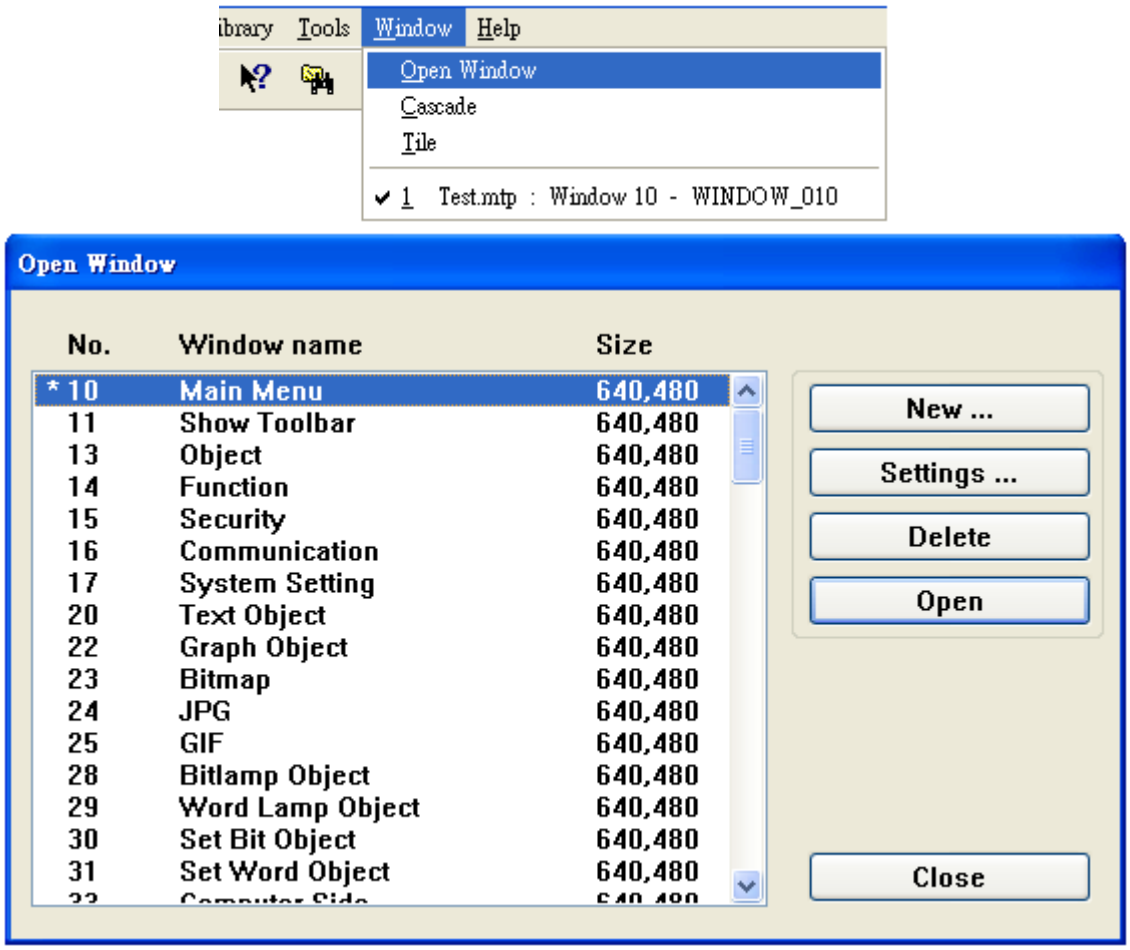
[Pattern color]
The color of the design.

[Filled]
The Filled option determines if the window's background color is shown or not during project design.

Underlay window
[Bottom], [Middle], [Top]
Up to three windows can be specified as underlay windows for each base window, from [Bottom] to [Top]. The objects on the background window are displayed on base window in order.
Popup window
[X], [Y]
Base window can also be used as pop-up window. [X] and [Y] set the pop-up location of the base window.

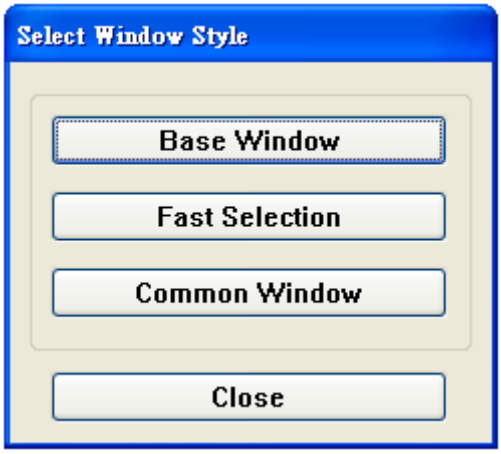
[Monopoly]
If the option is checked, when a base window is used as pop-up window and appears, users are not allowed to operate other windows before the base window is closed. If a base window is used as a keyboard window," Monopoly "property is automatically possessed by the window.

Another way to create a window is select [Open Window] from menu and [Open Window] dialog appears. Please refer to the illustration below.



Window No. and Window Name are listed on the message table.

Click [New…] and choose window type from [Select Window Style] dialog. New window can be created after click OK.



(2) Window Settings

EB8000 provides two methods to modify window attributes:

a) Right click on the assigned window from window tree and select [Settings] to change the window properties.

b) Select [Open Window] from menu and [Open Window] dialog appears. Select [Settings] to change the window properties.

(3) Open, close and delete a window

To open an existing window, except double clicking the window No. from window tree, another way is right click the assigned window from the window tree and choose [Open] to open the window.

It's the same operation process to close or delete an existing window but please note that the window has to remain in close status when deleting a window.

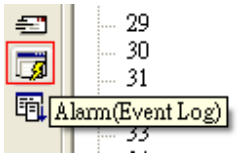
Chapter 7 Event Log

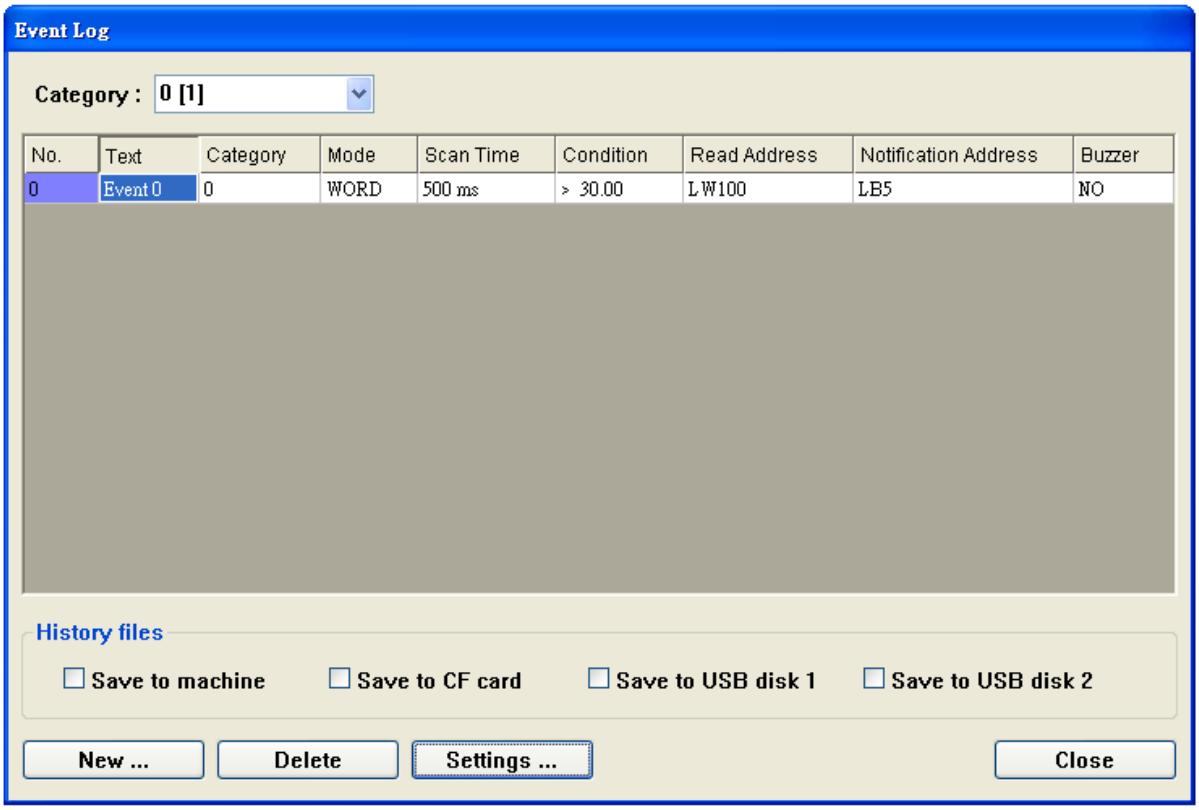
“ Event log” is used to identify the content of an event and the conditions triggering this event. In addition, the triggered event (sometimes it is called alarm) and the processing procedure of the event can be saved to the designate location through the EB8000 as eventlogyyyymmdd.evt format where yyyymmdd indicates the creating time and is set by the system. For example, a file name of event, logeventlog20061127.evt, means the file is created on Nov. 27, 2006.

Creating a new data log

Accompanied with alarm bar, alarm display and event display, users are able to clearly understand the life cycle of whole event from happening, waiting, processing to alarm disappearing. Before using these objects, the content of an event has to be identified first.

Click the [Alarm(Event Log)] icon, and [Event Log] dialog appears as below:

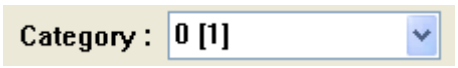




[Category]

The EB8000 provides category function and divides an event into 0~255 classifications. Alarm Bar、Alarm Display and Event Display can limit the displayed classifications.

[Catalog] selection determines the event catalog of current event. New added event type is determined by this function.



The [1] of 0[1] in the above illustration demonstrates only one existing identified event in the classification 0.

History files

History files determines the save location of an event log. However, when users simulate on PC, files will be saved on the eventlog subdirectory, the same the subdirectory of EasyBuilder8000.exe.

[Save to machine]
Record the event log to MT8000.

[Save to CF card]
Save the event log to CF card.

[Save to USB disk 1]
Save the event log to USB disk 1. The USB disk numbering rule is: the disk inserted to the USB interface in the first place is numbered 1, next is numbered 2 and the last is numbered 3. There's no relation with the interface location.

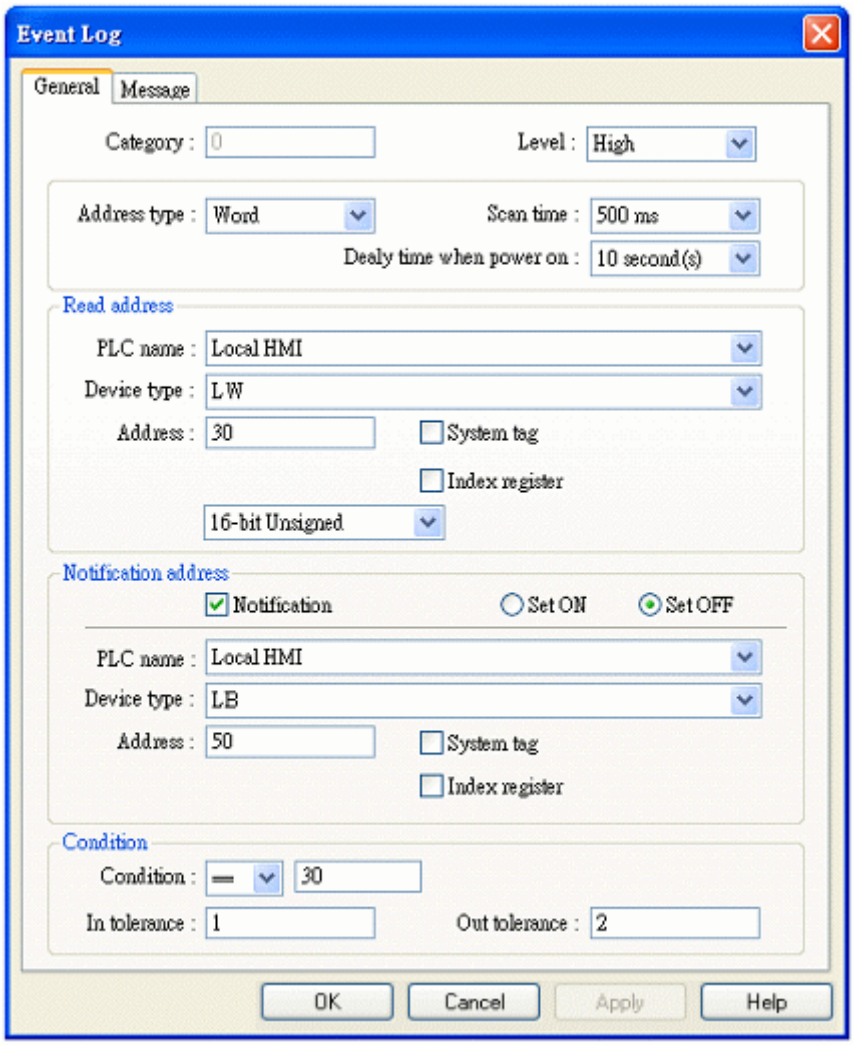
[Save to USB disk 2]
Save the event log to USB disk 2.

[New …]
Create a new event.

[Delete]
Delete a specific event.

[Settings …]
Modify the definition of a specific event.

After clicking [New…], [Event Log] dialog appears with two tabs and [General] tab shows as below:



[Category]
The category of the event.
[Level]
The level of the event: According to the degree of importance, users can choose ”Low”, “Middle”, “High”, or “Emgc”. When the number of event log is more than max number available in the system (the default is 1000, please refer to [General] of System Parameters to add extra records), less important events (lower level) will be deleted and new events will be added in.

[Address type]
The type of address—Bit or Word mode.

[Scan time]
The time interval of an event examination. By scan time, system checks if the event is satisfied with the triggered conditions.

[Delay time when power on]
The delay time of an event examination. System delays this time after rebooting so that it's able to check if the event is satisfied with the triggered condition and avoids the unnecessary event log record.

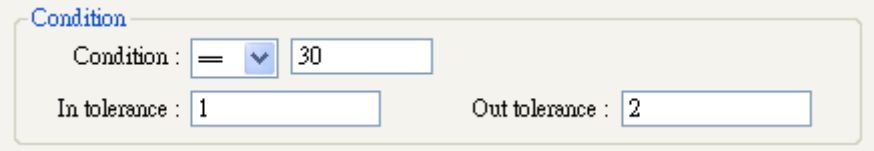
[Read address]
By reading the read address, system obtains the figure to check if an event is satisfied with the triggered condition. Please refer to Parts/General Settings for further details.

[Notification address]
When an event is triggered, the specific message is sent out from Notification address. Select [Set ON] to send ON message out from the address while select [Set OFF], Off message is sent out. Please refer to Parts/General Settings for further information.

[Condition]
Trigger conditions of an event. When the condition of [Address type] of an event is "Bit", "ON" or "OFF" of Trigger can be selected. The illustration below shows if Trigger[On] is selected, that is, the status of [Read address] changes from OFF to ON, an event will be triggered and generate an event log record (or an alarm).

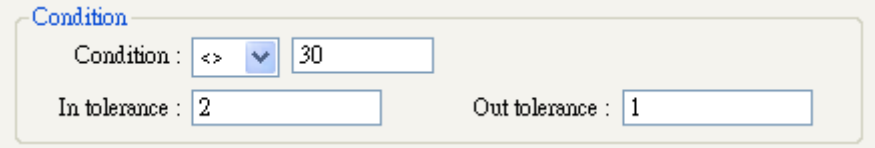
When the condition of [Address type] of an event is "Word", several selections are available as follows:

At this time, system will read values from [Read address] and then compare them with the trigger conditions to decide if the event is trigged. Especially if the trigger condition is ”==” or <>”, [In tolerance] and [Out tolerance] can be set where [In tolerance] is used for trigger condition and [In tolerance] is used for system’s normal condition.



From the example above, it indicates that if the value of [Read address] is bigger or equal to 29(=30-1) or smaller or equal to 31(=30+1), the event will be triggered.

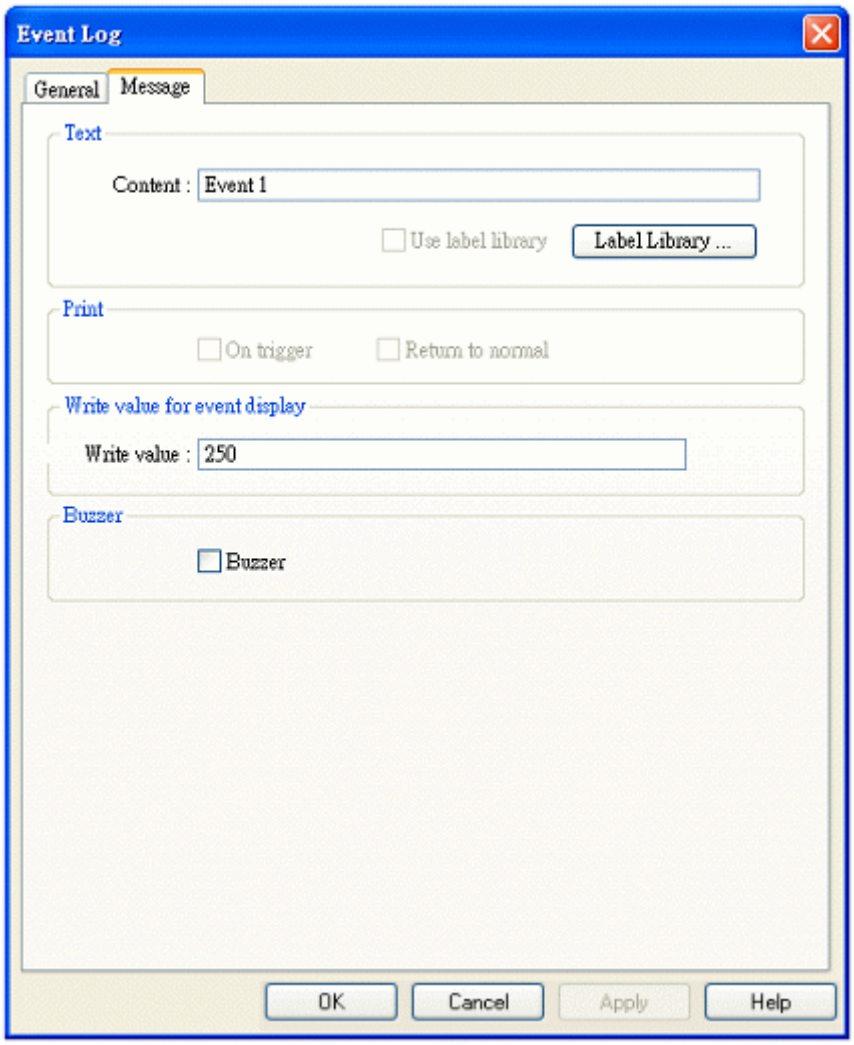
After the event is triggered, only when the value of [Read address] is bigger than 32(=30+2) or smaller than 28(=30-2) will the system return to the normal condition.



From the example above, it shows that system is under normal condition only when the value of [Read address] is bigger or equal to 28(=30-2) and smaller or equal to 32(=30+2).

When the event is triggered, system returns to normal condition only when the value of [Read address] is bigger or equal to 29(=30-1) and smaller than 31(=30+1).

Please refer to the picture below for the settings of [Message] tab.



Text

[Content]

The text context showed on alarm bar、alarm display and event display. Please refer to “Parts/General settings” for more information.

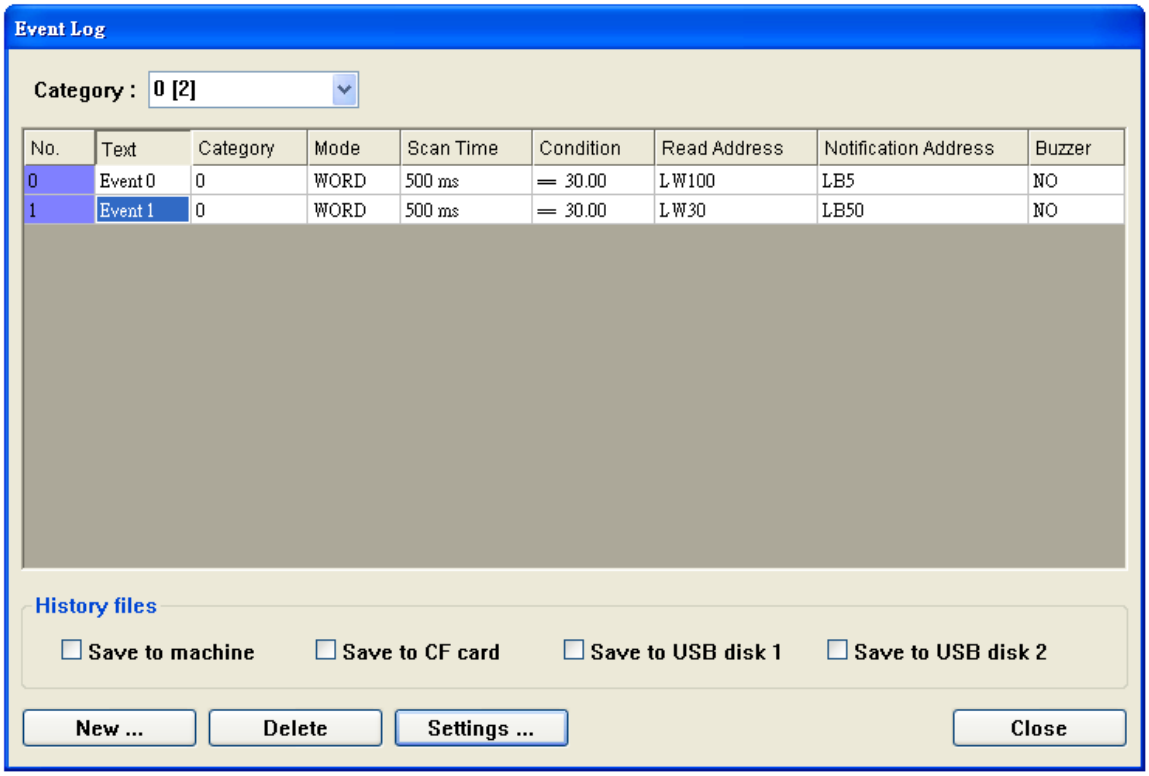
[Write value for event display]

When event display of the event is touched, the write value is sent out to the assigned address. Please refer to event display of parts chapter.

[Buzzer]

The warning alarm can be selected when an event is triggered.

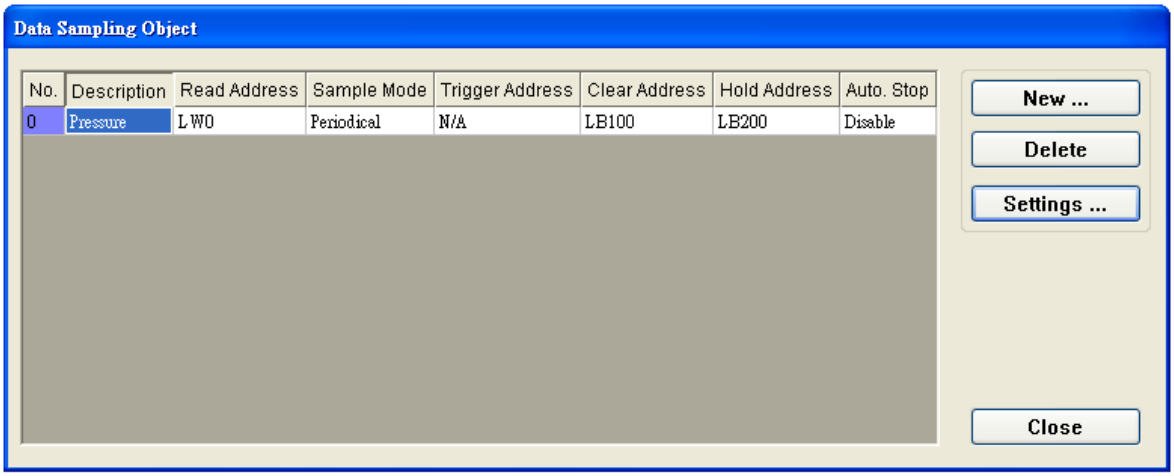
After the completion of each setting, a new event definition can be added as below:



Chapter 8 Data Sampling

“Data Sampling” identifies the method of data sampling, including sampling time and sampling location. Besides, EB8000 saves the obtained sample data as filenameyyyymmdd.dtl format to the assigned location where filename is defined by users and yyyymmdd is the built time setting by system. For example, if the file name is presser20061127.evt, it means the file saves the data sampled on Nov. 27, 2006.

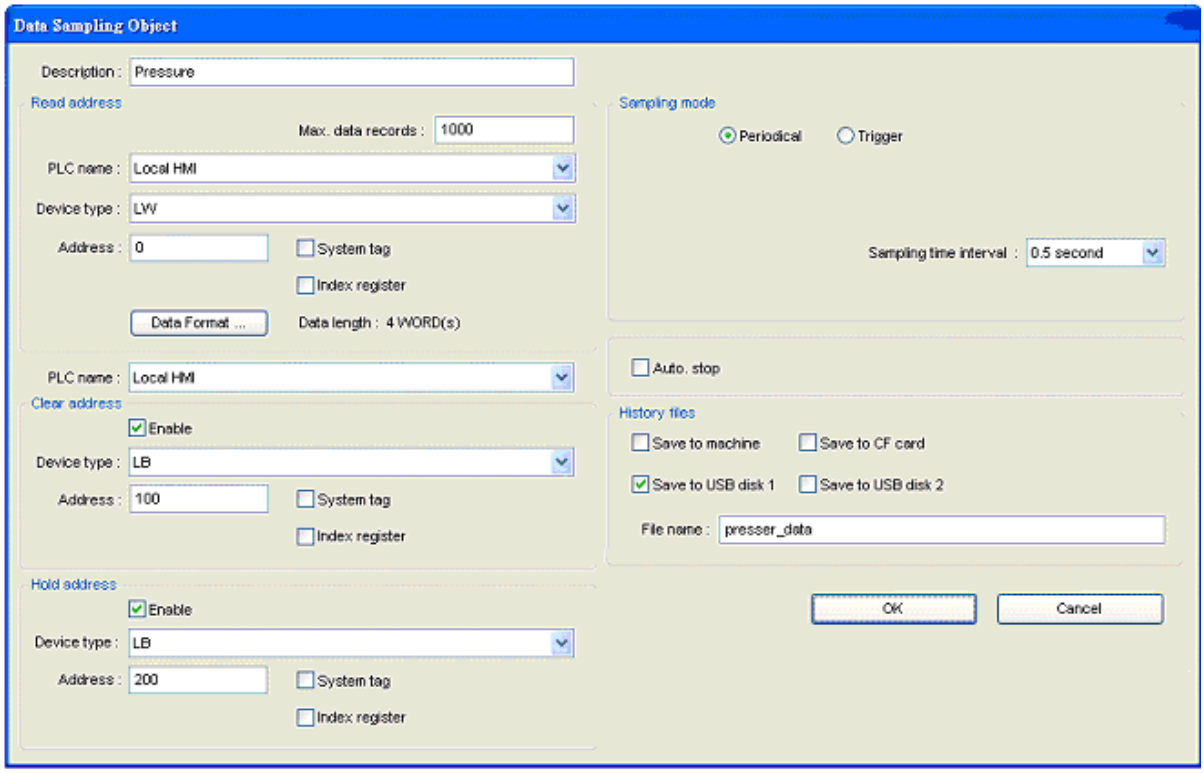
Create a new defined of data sampling
Before using Trend display to view the content of data sampling, the method of data sampling has to be defined. Click [Data Sampling] from toolbar and then Data Sampling Object dialog appears as below:



[New …]
Create a new “data sampling” definition.

[Delete]
Delete the assigned “data sampling”.
[Settings …]
Modify and set the “data sampling” definition

Click [New…] and the Data Sampling Object setting dialog appears as below:



Read address

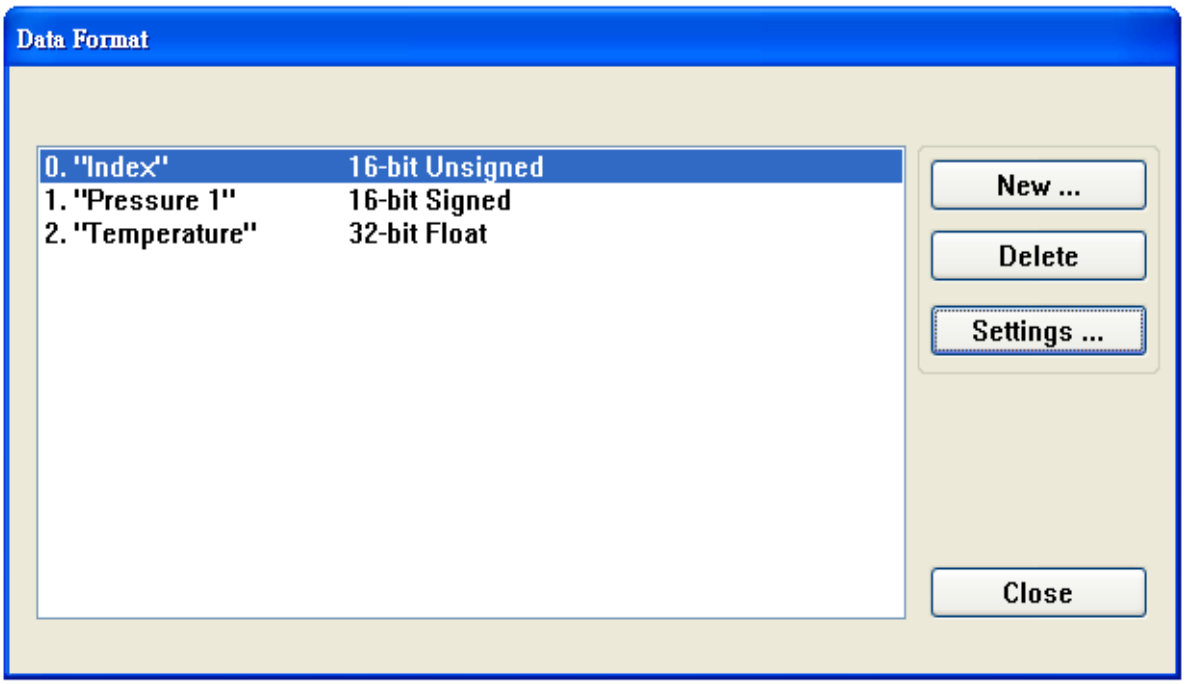
[Max. data records]

Max data records which can be saved to a data sampling definition.

[Data Format …]

The format of a data sampling: A data sampling may include more than one record and EB8000 is able to retrieve different formats of records at the same time. After clicking [Data Format], users can use “Data Format” dialog to define the content of a record. Take the following as an example, users define three set of data: “Index”(16-bit Unsigned)、“Pressure 1”(16-bit Signed) and “Temperature”(32-bit Float) respectively and 4 words in total length. In other words, EB8000 retrieves the length of 4 words as a record starting from the assign address.

Please refer to Parts—General Settings for more details.

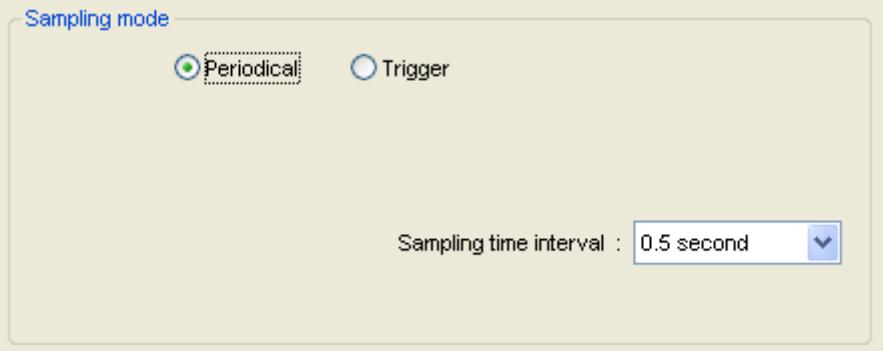


[PLC name]
Select the target PLC of data sampling.

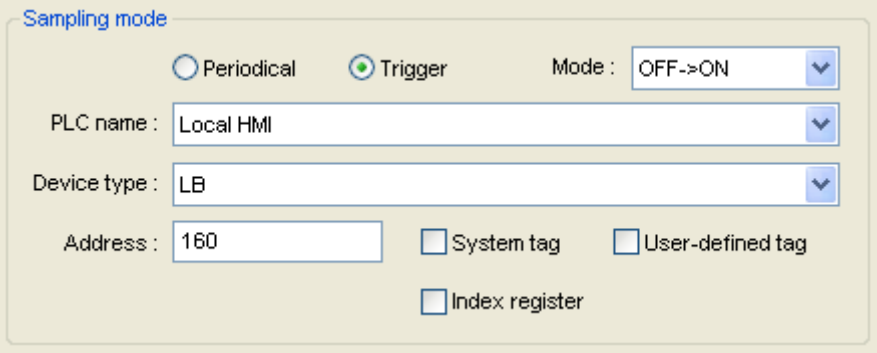
[Clear address]
If the status of the assigned address is ON, obtained data will be cleared and the number of data sampling will be set to zero.

[Hold address]
If the status of the assigned address is ON, sampling will be paused until the status of assigned address returns to OFF. Please refer to Parts—General Settings for other details.

Sample mode
EB8000 provides two method of sampling: “Periodical” and “Trigger”. If “Periodical” mode is selected, EB8000 samples the data by a fixed time frequency. Users have to set the sampling time interval.



If “Trigger” mode is selected, users can use a specific address status to trigger the data sampling.



[Mode]

Mode determines the condition to trigger the data sampling. Multiple choices are as follows:

“OFF->ON” If the assigned address status is from OFF to ON, data sampling is triggered.

“ON->OFF” If the assigned address status is from ON to OFF, data sampling is triggered.

“ON<->OFF” If the assigned address status is changed, data sampling is triggered.

Please refer to Parts—General Settings for more details.

[Auto stop]

When the number of obtained data is equal to [Max. data records], if the Auto stop option is selected, data sampling will stop automatically or EB8000 will delete old record and add in new data.

History files

History files assigns the save location of data sampling record. But when users do the simulation on PC, data is saved to datalog subdirectory, the same subdirectory as EasyBuilder 8000.exe.

[Save to machine]

Save the sampling to MT8000 display.

[Save to CF card]

Save the sampling to CF card.

[Save to USB stick 1]

Save the sampling to USB stick 1. The USB stick numbering rule is: the stick inserted to the USB interface in the first place is numbered 1, next is numbered 2 and the last is numbered 3. There's no relation with the interface position.

[Save to USB stick 2]

Save the sampling to USB stick 2.

[File name]

Set the file name of sampling and then EB8000 adds the time mark following the file name. For example, if users set the file name as "pressure", the real file name saved will become pressure20061127.dbl where 20061127 stands for the built date.

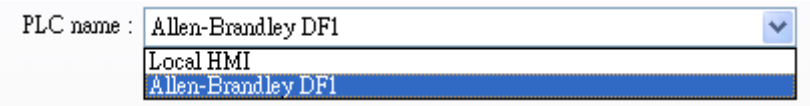
Chapter 9 Object's General Attributes

The contents of object's general attribute setting include:

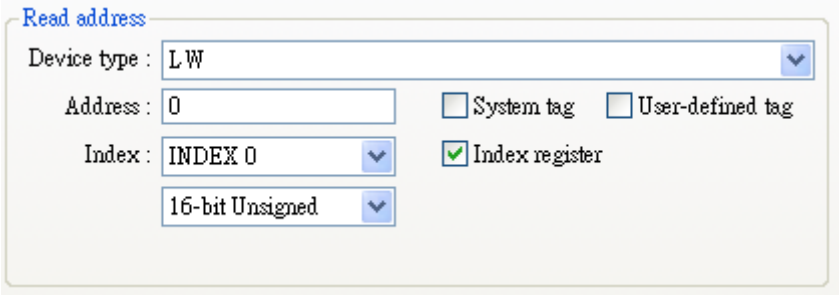
1. Selecting the Connection PLC Device
2. Setting the Reading and Writing Address
3. Using Shape Library and Picture Library
4. Setting Text Content
5. Adjusting Profile Size

1. Selecting the Connection PLC Device

When using some objects, selection of the connection PLC device is required. See the picture below, [PLC name] is to indicate the name of the connection PLC device. The picture shows that there are two PLC devices available for selection: "Local HMI" and "Allen-Brandley DF1." These listed available PLC devices are sourced from "device table" in "system parameters."

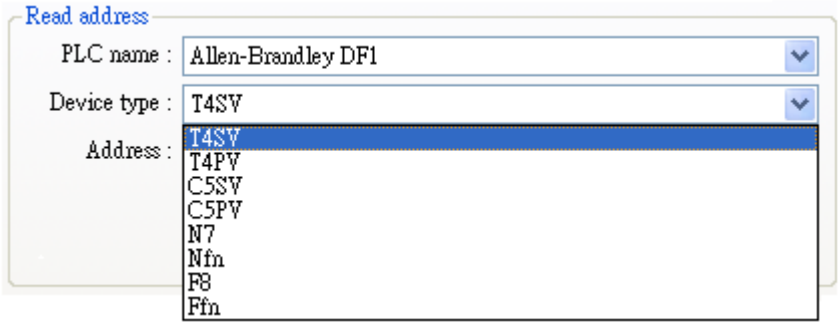


2. Setting the Reading and Writing Address



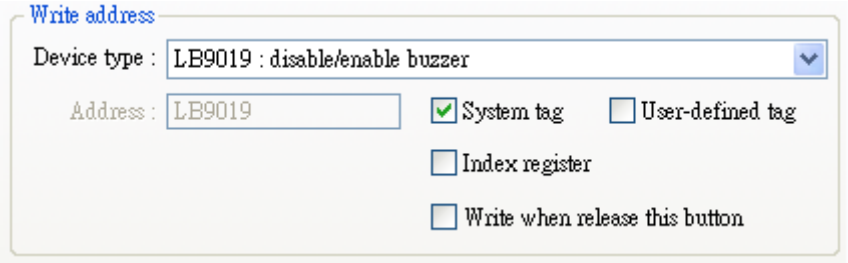
The above picture shows that the following items are contained in Reading and Writing Address settings:

[Device type]
In selection of device types, when the connection PLC device is different, there will be different device types for selection.

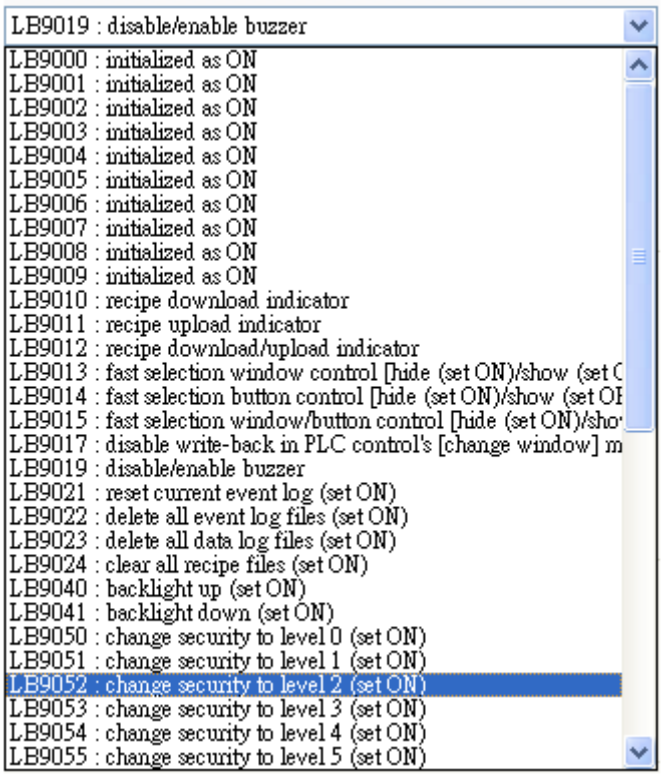


[Address]
Setting the reading and writing address.

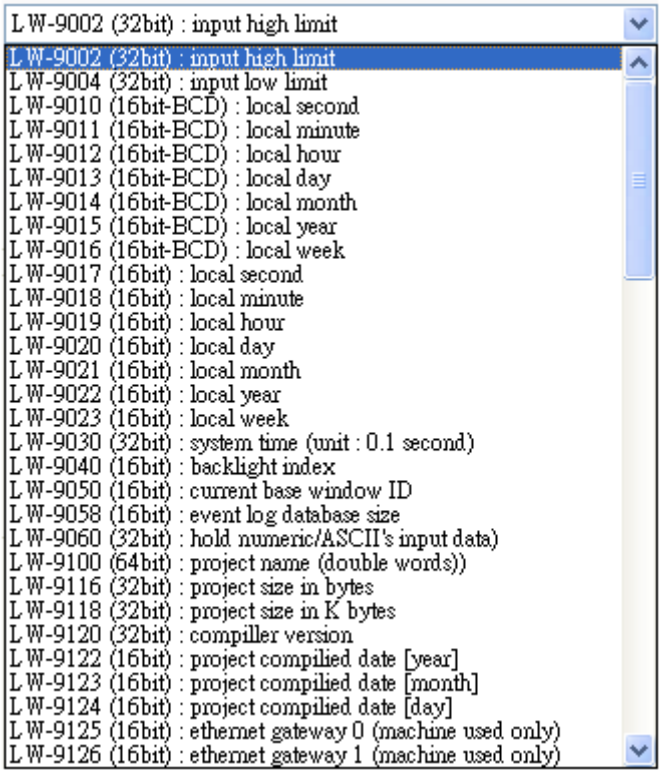
[System tag]
Address tag includes “system tag” and “user-defined tag.” System tag, including bit address system tag and word address system tag, is to reserve the addresses of particular purposes for the system. When selecting “system tag,” in addition to that [Device type] will show the content of “system tag,” [Address] will indicate the selected system tag. Refer to the picture below.



The following pictures show partial contents of bit address system tag and word address system tag respectively, and for further information, please refer to the illustrations in the “label library” section.



bit address system tag



word address system tag

[User-defined tag]

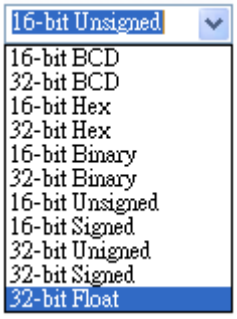
“User-defined tag” is for users to use the tag to define regularly used addresses and then to enhance the utility of MTP file. The way of using “user-defined tag” is the same as using “system tag,” and for further information, please refer to the illustrations in the “label library” section.

[Index register]

Refer to the illustrations in “index register” section for information on if it is necessary to select “index register” or not.

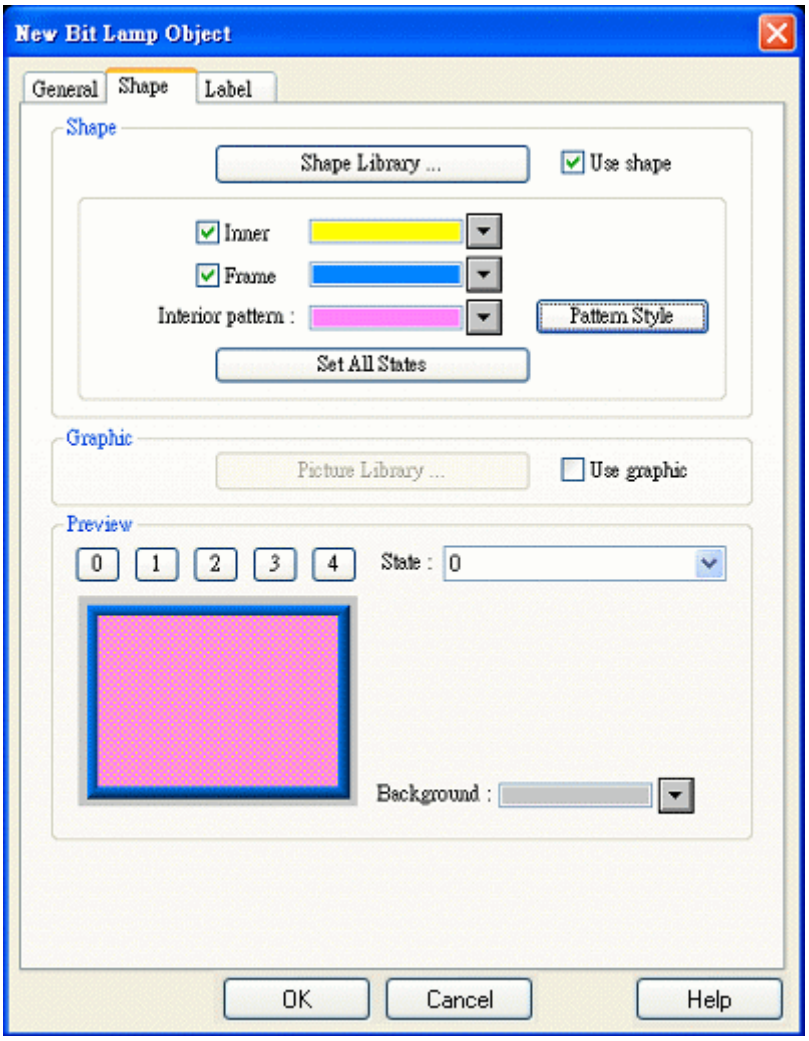
Selecting Numeric Type

The EB8000 supports the following listed numeric types. It is necessary to select the proper numeric type, especially when using address tag.



3. Using Shape Library and Picture Library

Shape Library and Picture Library are available for some objects to enhance the object's visual effects. See the picture below, go to the Bit Lamp Object's Properties menu and then click the [Shape] tab to set up Shape Library and Picture Library.



The descriptions of each item's setting on the [Shape] menu are as follows:

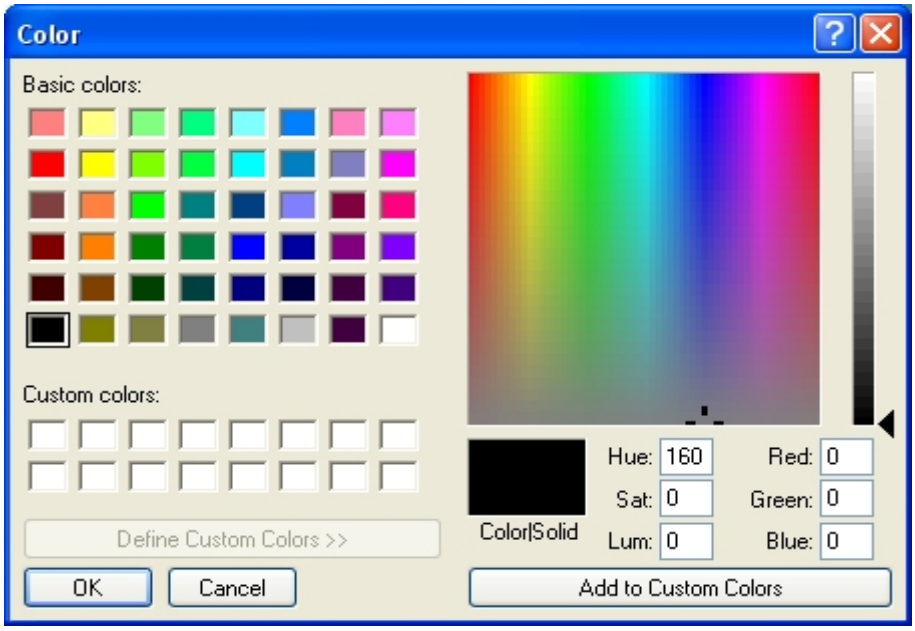
Settings of Shape Library

[Shape Library …]

Refer to the part (I) at the last of this section for information related to the settings of [Shape Library …].

[Use Shape]
Set whether or not to use the functions in Shape Library by selecting [Use Shape] or not.

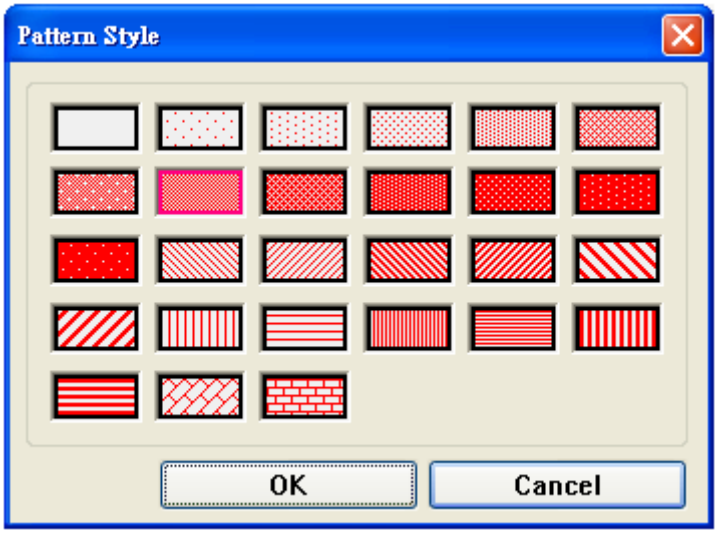
[Inner]
Set whether or not to add inner to the Shape by selecting [Inner] or not. When selecting [Inner] and clicking the color tab, the setting dialog box, as shown in the picture below, will be displayed to set the inner's color.



[Frame]
Set whether or not to add a frame to the Pattern by selecting [Frame] or not. When selecting [Frame] and clicking the color tab, the setting dialog box will be displayed to set the frame's color.

[Interior Pattern]
[Interior Pattern] is used to set the color of the interior pattern.

[Pattern Style]
Click [Pattern Style] and a setting dialog box, as shown in the picture below, will be displayed to set the pattern style.



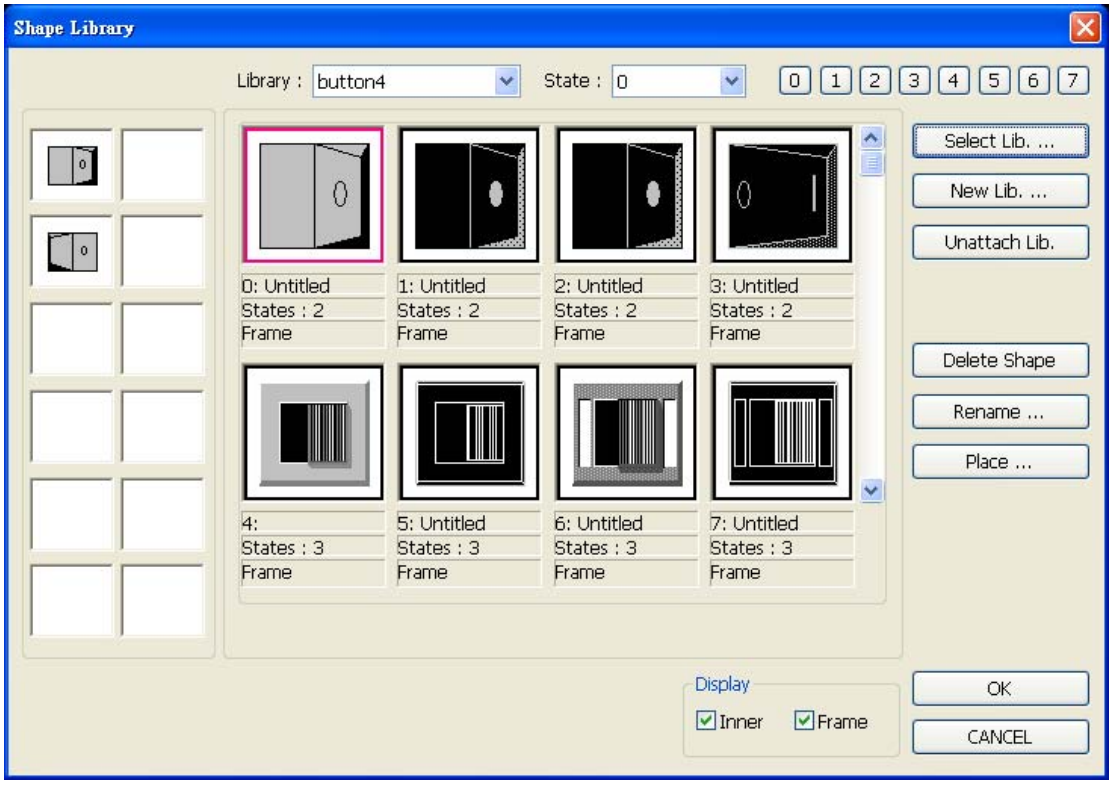
[Set All States]
[Set All States] is used to set all attributes of the present state to other states.

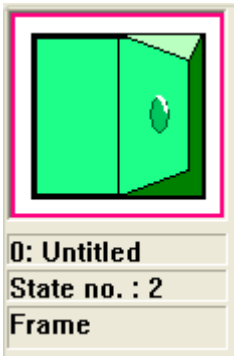
Settings of Picture Library

[Picture Library]
Refer to the part (II) at the last of this section for information related to the settings of [Picture Library …].

[Use Graph]
Set whether or not to use the functions in Picture Library by selecting [Use Graph] or not.

(I) How to set [Shape Library …]
Click [Shape Library …] and a setting dialog box, as shown in the picture below, will be displayed. From the dialog box, you can see that the presently selected pattern is marked with a red frame.

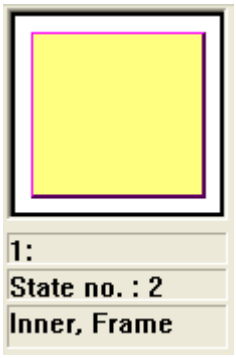




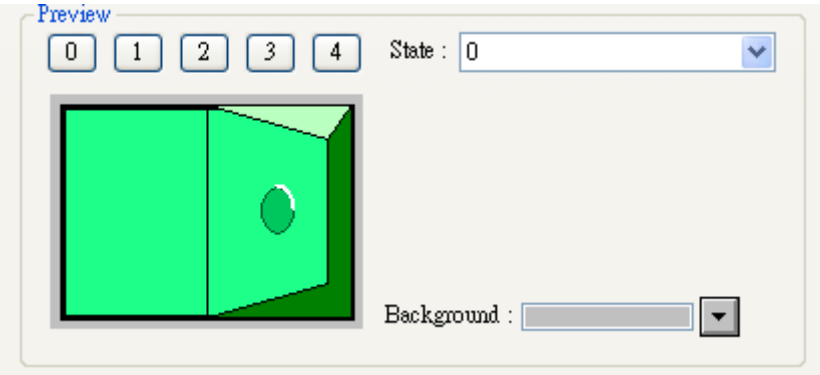
The above picture gives information of one of the Shapes in the Shape Library as follows:

0: Untitled	This indicates the Shape's name and number in the library.
State no.: 2	This indicates the number of the Shape's states, and in this case, it shows the Shape possesses two states.
Frame	This indicates that the Shape is set with "frame" only.

And the picture below shows that the Shapes is set with "inner" and "frame."

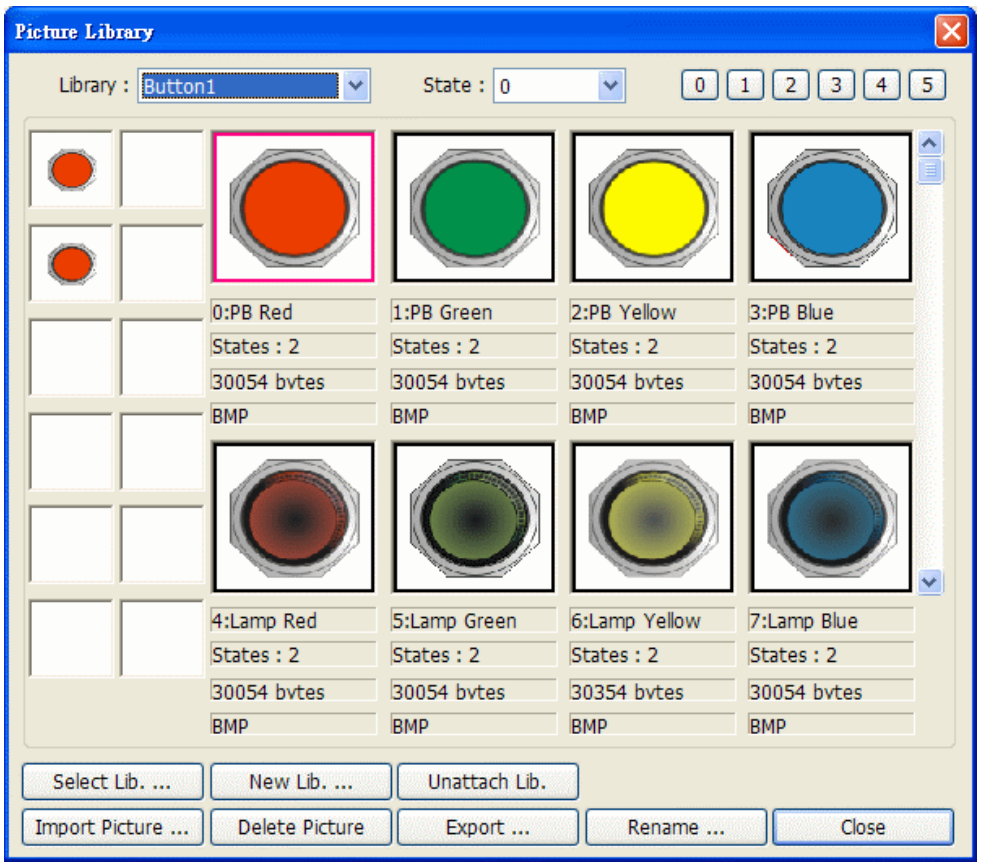


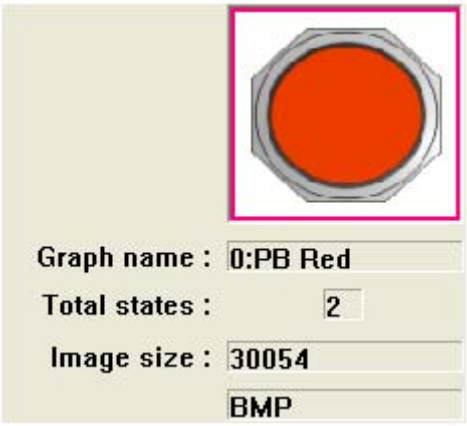
Refer to the illustrations in the “Setting-up and using Shape Library and Picture Library” section for the details about all of the settings in the “Shape Library’s setting dialog box.” After completing all the settings and clicking [OK], the selected Shape will be applied to the object, as shown in the picture below.



(II) How to set [Picture Library …]

Click [Picture Library …] and a setting dialog box, as shown in the picture below, will be displayed. From the dialog box, you can see that the presently selected picture is marked with a red frame.

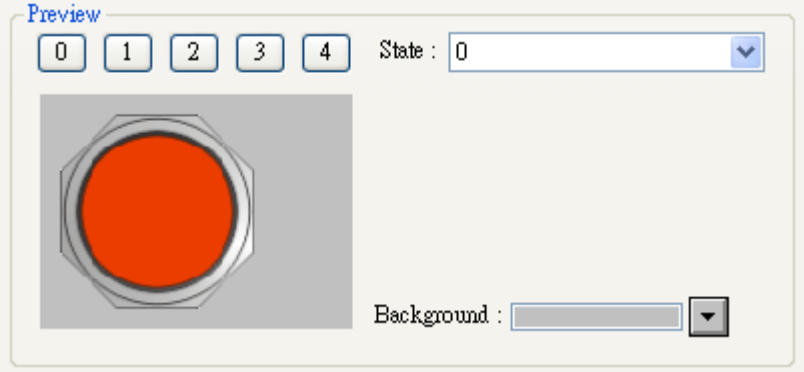




The above picture gives information of one of the Picture in the Picture Library as follows:

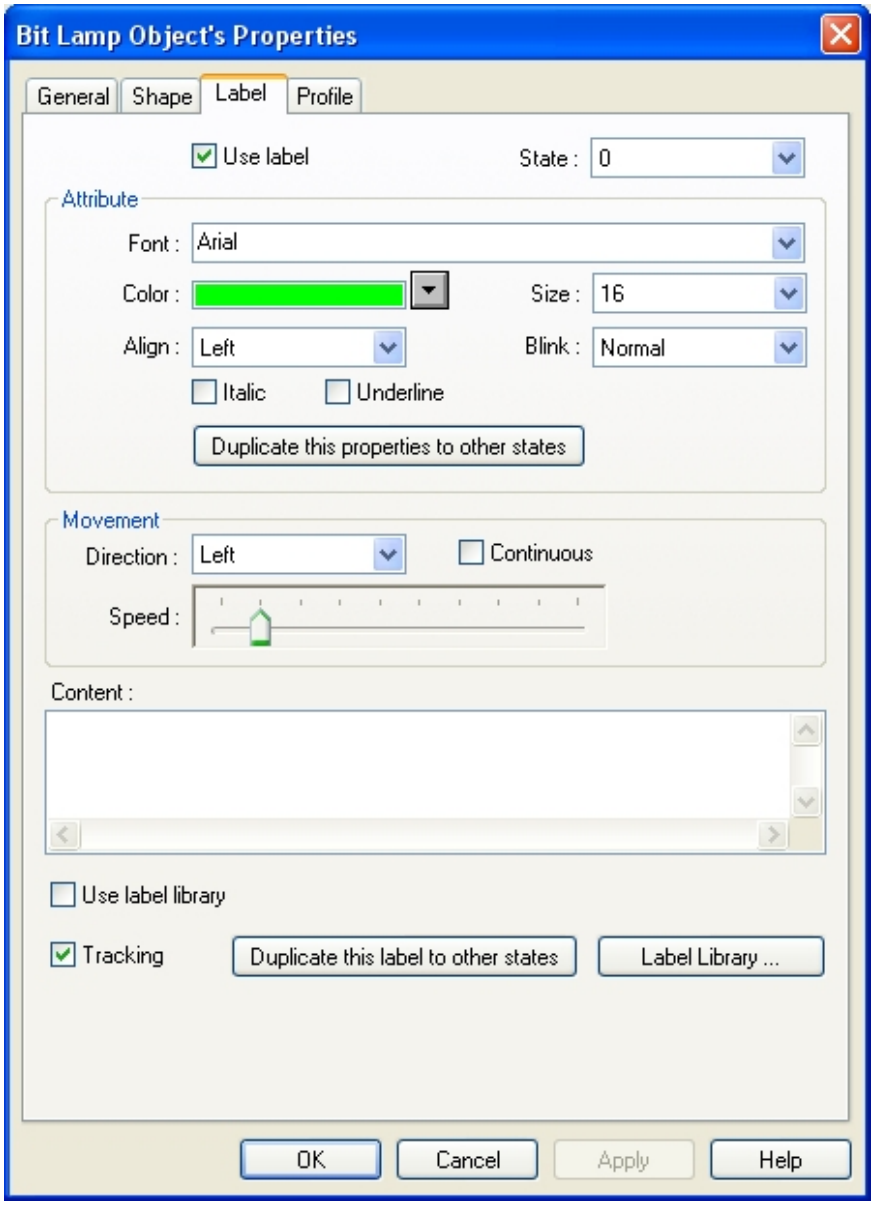
Picture name	: 0 : PB Red	the name of the Picture
Total states	: 2	the number of the Picture states
Image size	: 30054	the size of the Picture
	BMP	the format of the Picture; BMP means bitmap Picture and its format can be JPG or GIF.

Refer to the illustrations in the “Setting-up and using Shape Library and Picture Library” section for the details about all of the settings in the “Picture Library’s setting dialog box.” After completing all the settings and clicking [OK], the selected Picture will be applied to the object, as shown in the picture below.



4. Setting Text Content

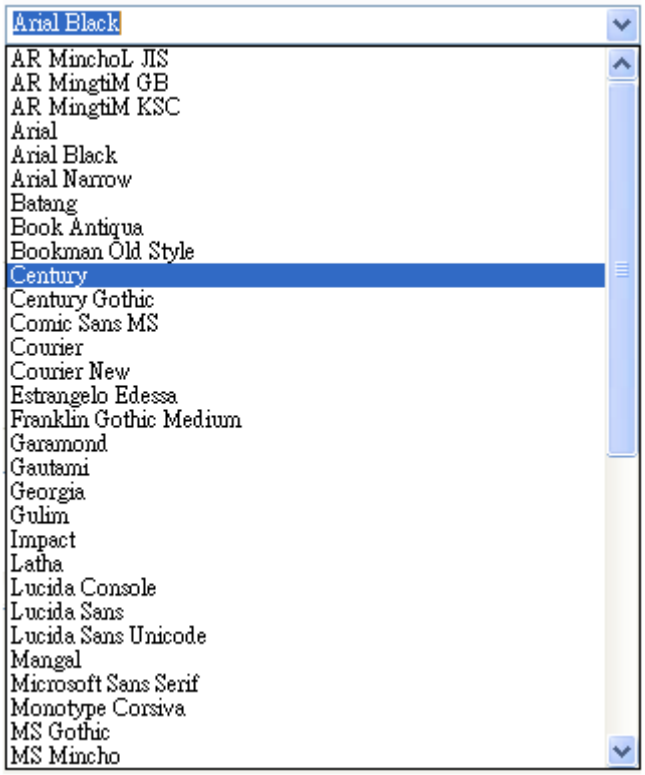
See the picture below, go to the Bit Lamp Object's Properties menu and then click the [Label] tab, where you can set the text content that is going to be applied in the object.



Settings in "Attribute"

[Font]

[Font] is used to select the font for the text. The EB8000 supports WINDOWS's true-font. See the picture below.

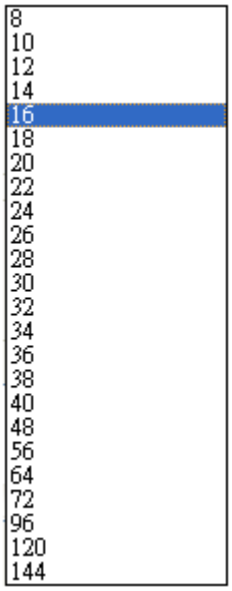


[Color]

[Color] is used to select the font color for the text.

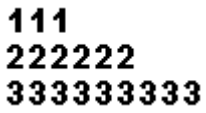
[Size]

[Size] is used to select the font size for the text. The EB8000 supports all the text sizes shown in the picture below.

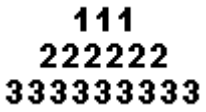


[Align]

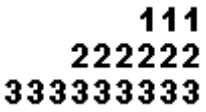
[Align] is used to define the alignment method of the text input more than one line. The picture below shows how the lines of the text to be aligned by specifying “Left” in [Align].



The picture below shows how the lines of the text to be aligned by specifying “Center” in [Align].



The picture below shows how the lines of the text to be aligned by specifying “Right” in [Align].

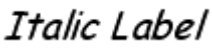


[Blink]

[Blink] is used to define how the text blinks. There are three options in text blinking setting: specifying “Normal” for non-blinking text, or specifying the blinking speed to be “1 second” or “500 ms” for blinking text.

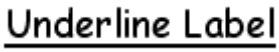
[Italic]

[Italic] is used to set whether or not to use italics.



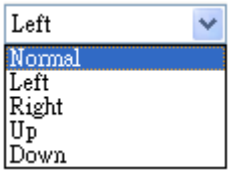
[Underline]

[Underline] is used to set whether or not to underline the text.



Settings in “Movement”

[Direction]
[Direction] is used to set the direction of the text movement while using the marquee effect, which is available in a choice of directions shown in the picture below:



[Continuous]
When setting to use the marquee effect, the text in the picture below will be displayed in two ways:

When not selecting [Continuous], the latter text will emerge only after the former text disappears completely. See the picture below.

When selecting [Continuous], the text will emerge continuously.

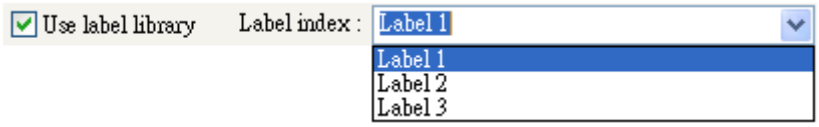
[Speed]
[Speed] is used to set the speed of the text movement.

[Content]

[Content] is used to set the content of the text. If using the Label Library, the content will be sourced from the Label Library.

[Use label library]

See the picture below, the content of the text will be sourced from the Label Library by selecting [Use label library].



[Tracking]

When selecting [Tracking], moving the text of some state will also move the text of other states.

[Duplicate this label to other states]

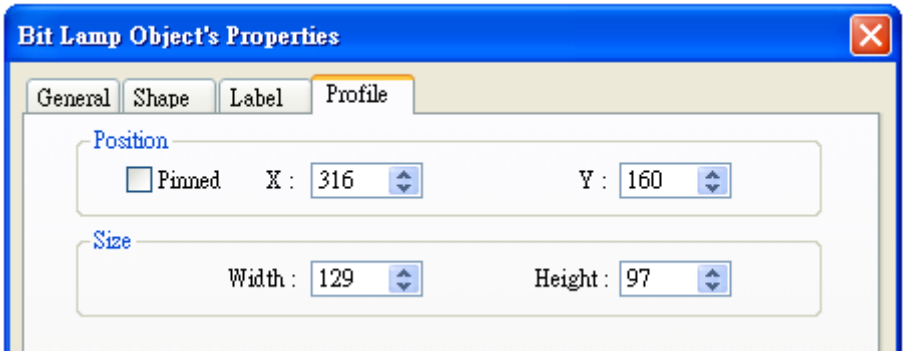
This function can be used to duplicate the present text content to the other states.

[Label Library …]

Refer to the illustrations in the “Setting-up and using Text and Label Library” section to view the content of label library.

5. Adjusting Profile Size

See the picture below, go to the Bit Lamp Object's Properties menu and then click the [Profile] tab to adjust the position and size of the object.



Settings in "Position"

[Pinned]
Pinning the settings of the position and size of the object by selecting [Pinned], and the position and size of the object will not be able to be changed.

[X] and [Y] are the coordinates on the top left-hand corner of the object.

Settings in "Size"

[Width]
[Width] is used to adjust the width of the object.

[Height]
[Height] is used to adjust height of the object.

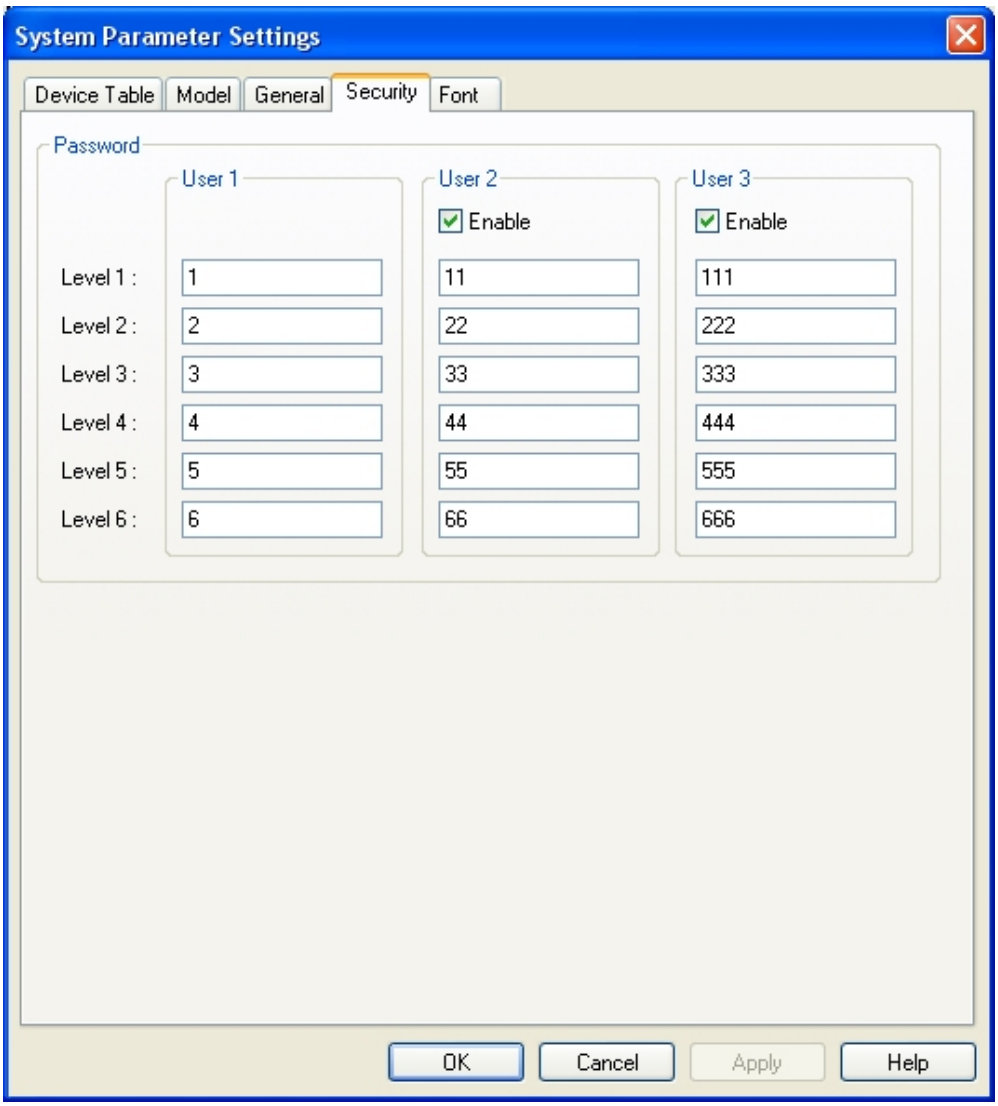
Chapter 10 Object's Security Guard

The EB8000's object's security guard includes two parts:

1. Setting and Changing Password
2. Object's Safety

1. Setting and Changing Password

The EB8000 provides three groups of passwords (User 1, User 2, User 3), and each group of password includes 6 security levels. The User 2 and User 3 groups of passwords can be disabled. Users can set the passwords in the [Security] tab of [System parameters]. Each group of password must consist of 0-9 digits.



Level 1 is the lowest security level and Level 6 is the highest security level. When operating the MT8000, the EB8000 will set up different operation levels in accordance with the password table after users give a successful input of passwords. When different Levels use the same password, the password will be invalid to the higher level.

In addition to inputting the passwords to the system reserved [LW9220] register, which is a double words value, a correct process of password setting requires that users have to use [LW9219] to appoint the existing user. In [LW9219], it is necessary to use the digits 1, 2, and 3 to represent User 1, User 2, and User 3 respectively, otherwise all of the users who input passwords will be categorically considered User 1.

When the operation of an object is set to limit the operation level of users, the user's security level must be equal or higher than the object's operation level. For example, when an object's operation level is set to Level 2, if a user's security level is at or between Level 2 and Level 6, the user is allowed to operate the object.

When operating the MT8000, all of the passwords from User1 to User 3 (36 words in total) can be obtained by reading the system reserved registers from [LW9500] to [LW9534].

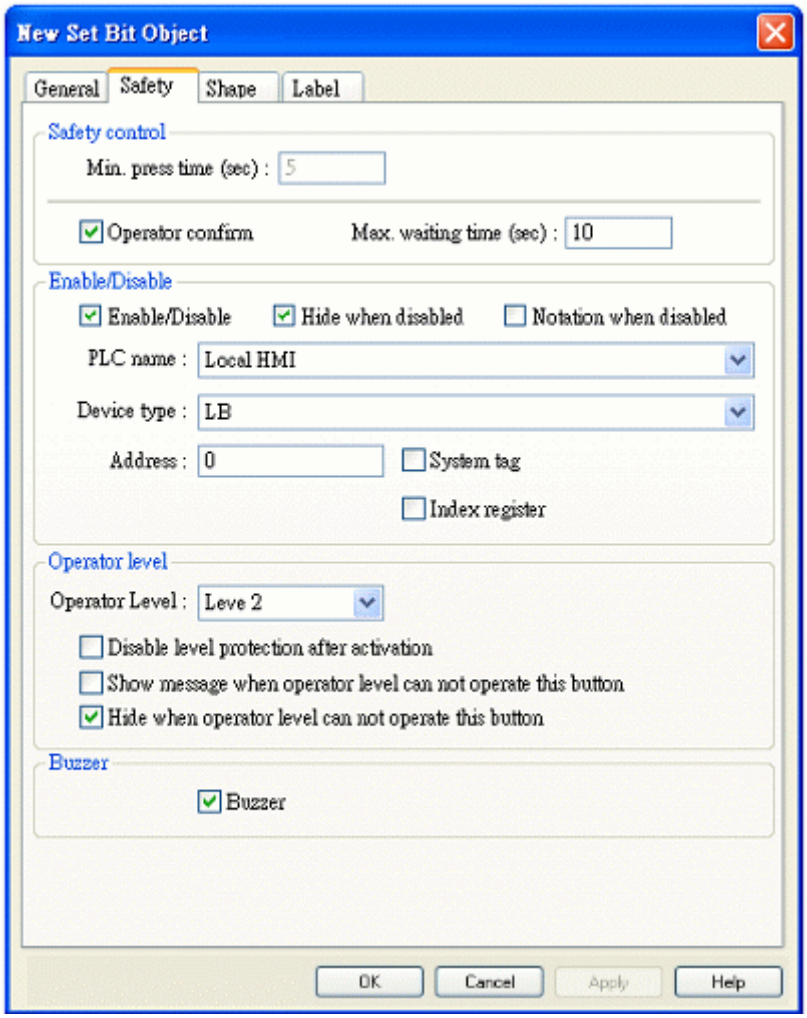
Users can change passwords even when the MT8000 is in operation. By using the system reserved register [LB9061], when switching its state from OFF to ON, the EB8000 will use the data saved in the system reserved registers from [LW9500] to [LW9534] to update the password table, and the new passwords will be available immediately. There is something important here that the user's operation level will never be changed when the password table is updated.

Users can also enforce to switch the current operation level, but that is only limited in use to lower the level. The only way to advance the level is to set a new password. The following reserved register address can be used to switch the current operation level.

[LB9050] enforce to lower the user operation level to level 0
[LB9051] enforce to lower the user operation level to level 1
[LB9052] enforce to lower the user operation level to level 2
[LB9053] enforce to lower the user operation level to level 3
[LB9054] enforce to lower the user operation level to level 4
[LB9055] enforce to lower the user operation level to level 5

The current security level can be obtained by reading the system reserved register [LW9222].

2. Object's Safety



The above picture shows the content of Object's Safety, which is divided into several parts:

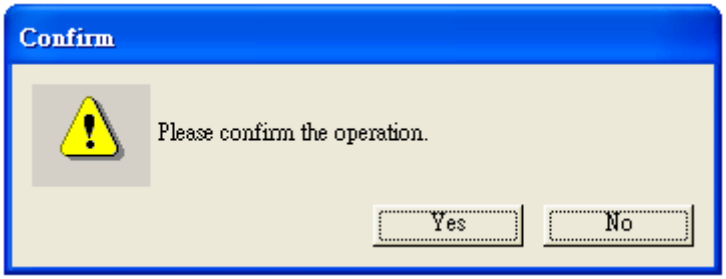
a. Safety control
b. Enable control
c. Operator level
d. Buzzer

a. Safety control

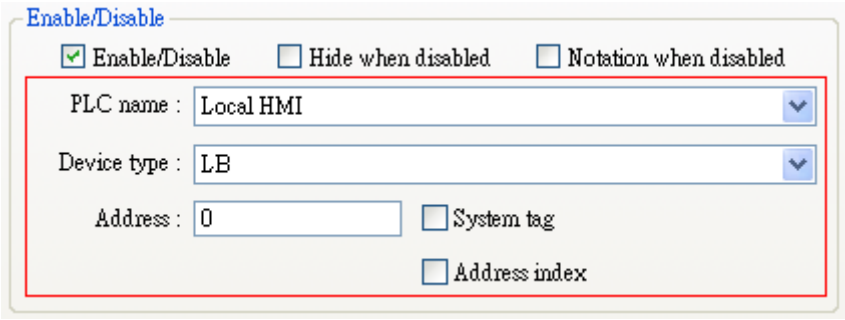
"Safety control" is mainly used to avoid operator's incorrectly controlling an object in an unawareness situation. At present there are two methods of protection:

[Min. press time (sec)]
If only the time of continuously pressing an object is not less than the value of [Min. press time (sec)], users can operate the object successfully.

[Operator confirm]
After pressing the object, a dialogue box, as shown in the picture below, will display, the operator can decide whether or not to perform the operation according to the real situation. The dialogue box will close automatically when the time of the operator making the decision on whether or not to perform the operation is longer than the value of [Max. waiting time (sec)].



b. Enable control
When the function is applied to an object, whether or not to allow the object to be operated will decide the state of the appointed bit address (or called “Enable” address). ”Enable” address must be in bit address format. The content of the address can be set in a dialogue box as shown in the picture below.

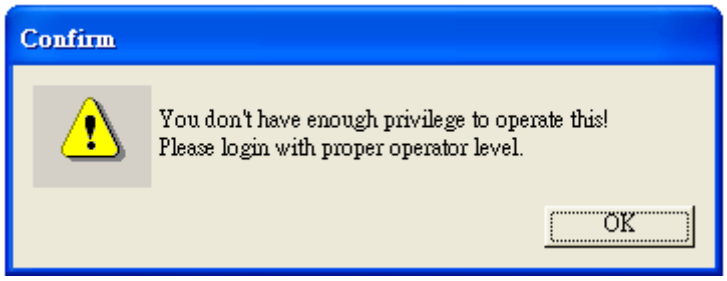


Fox example, supposed that the “Enable control” function is applied to some “Set Bit” object and the “Enable” bit address is set to [LB0], then the “Set Bit” object can be operated when the state of [LB0] is ON. The “Enable control” function also provides the following settings.

[Enable/Disable]
The “Enable control” function can be used by selecting the check box
[Hide when disabled]
When using the “Enable control” function and the state of “Enable” bit address is set to OFF, the object will be hidden.
[Notation when disable]
When using the “Enable control” function and the state of “Enable” bit address is set to OFF, the object will not be hidden but marked with a particular symbol instead.

c. Operator level
This function can be used to set the object’s operation Level, deciding which level’s operator is permitted to operate the object. When “Operator level” is selected as ”None”, it means the operation is open to the operators of all levels. The following settings are also available in the function:
[Disable level protection after activation]
Once the operator’s current operation level conforms to the operation condition of the object, the system will stop checking the operation level of the object for good. In that case, even if the current security level is lower than the object’s operation level, it will not affect the operation of the object.

[Show message when operator level can not operate this button]
When the operator’s current security level does not conform to the operation condition of the object, a warning dialogue box, as shown in the picture below, will display when pressing the object.



[Hide when operator level can not operate this button]
When the operator’s security level does not conform to the operation condition of the object, the object will be hidden.

d. Buzzer

Each object can be set to use the buzzer or not individually. The EB8000 also provides the reserved register [LB9019] as a switch of Buzzer. When the state of [LB9019] is OFF, the buzzer can be used. When restarting the machine, the EB8000 will use the state of the previous setting.

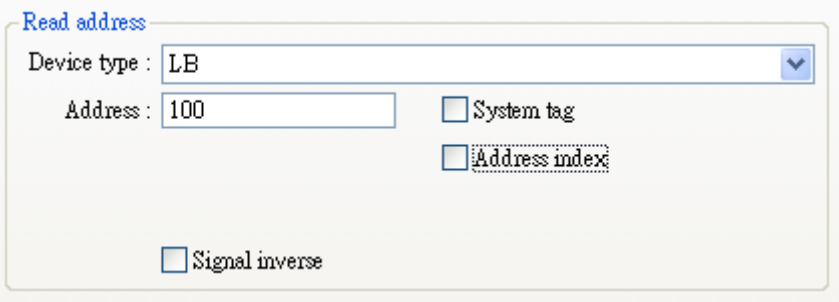
Chapter 11 Index Register

Address Index

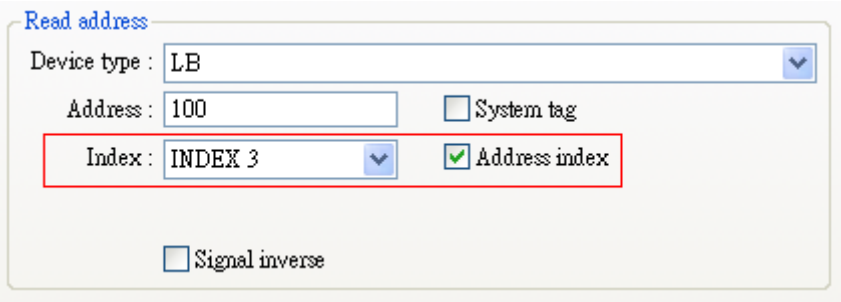
The EB8000 provides 16 index registers, and that enables users to enjoy a more flexible approach to application of the addresses. The addresses of the 16 index registers are as follows:

INDEX 0 [LW9200] (16-bit)
INDEX 1 [LW9201] (16-bit)
INDEX 2 [LW9202] (16-bit)
INDEX 3 [LW9203] (16-bit)
.
.
INDEX 14 [LW9214] (16-bit)
INDEX 15 [LW9215] (16-bit)

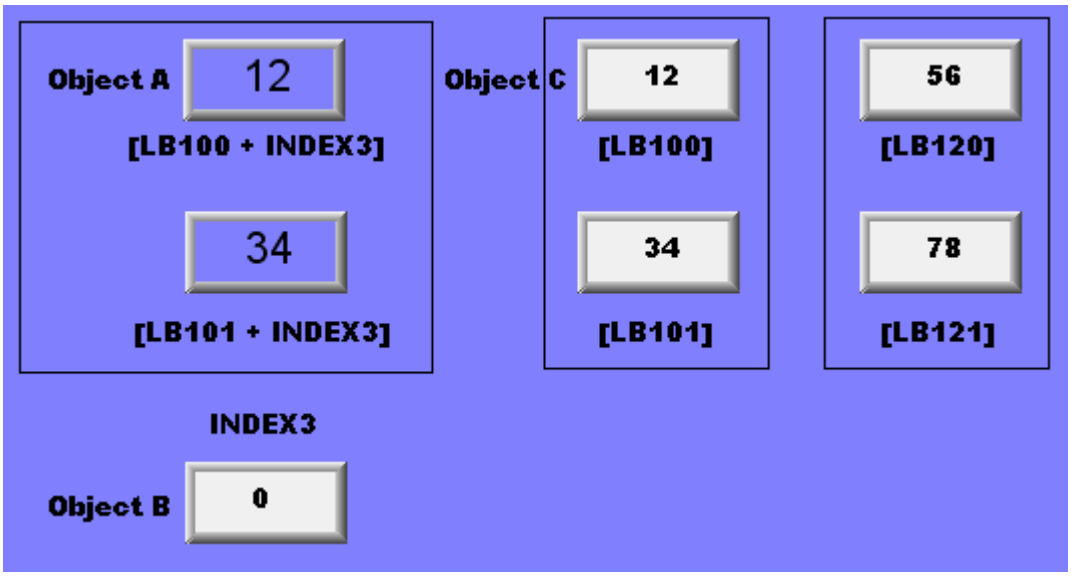
Here is an example to describe how to use the index registers. See the picture below, the “Read address” will be read as [LB100] while [Address index] is not selected.



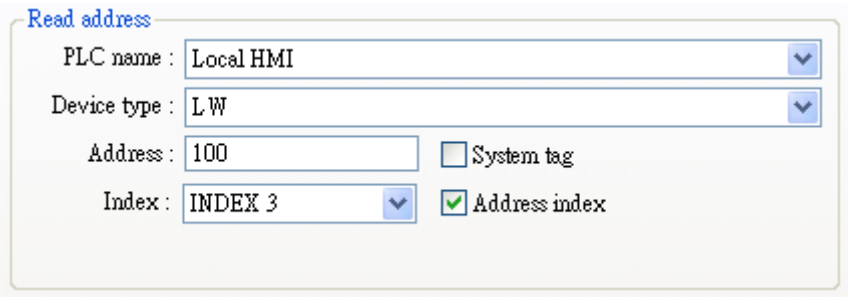
But in the picture below, the “Read address” becomes [LB(100 + INDEX3)] while [Address index] is selected, and INDEX3 represents the data at Index Register 3 or the [LB9023] address; in other words, if the data at the [LB9023] address is 5, the “Read address” in the picture below became [LB105].



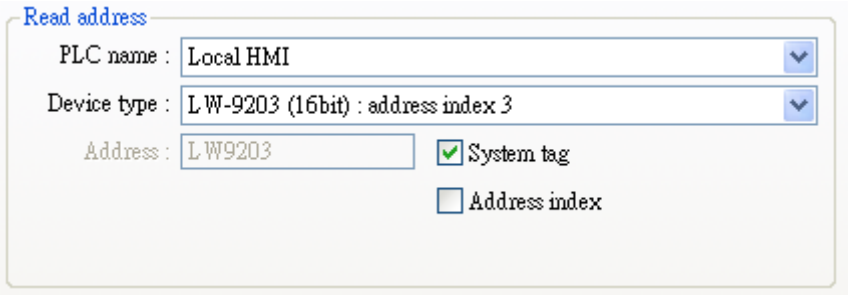
By making use of the index registers, users can change object's reading and writing addresses online without changing the object's content. For example, in the picture below, INDEX3 is 0, and that means the data at the [LB9023] address is 0, so to reading the content of [LB100 + INDEX3] and [LB101 + INDEX3] means to read the content of [LB100] and [LB101].



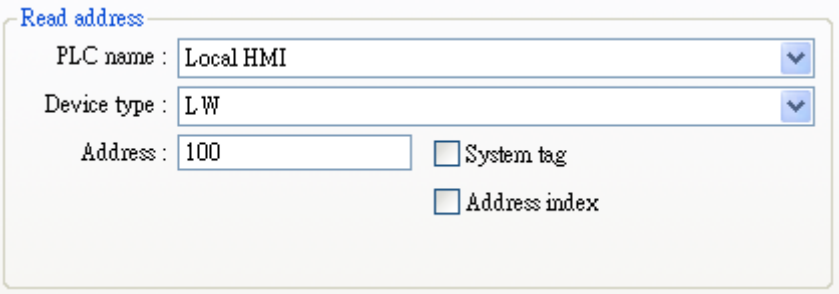
At this time, the setting of Object A's "Read address" is as follows:



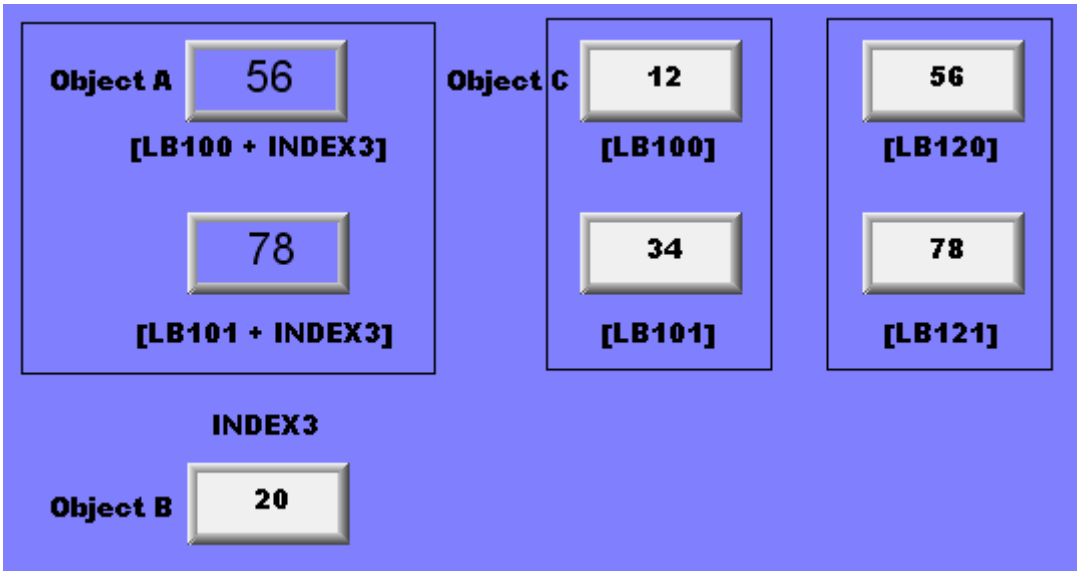
And the setting of Object B's "Read address" is as follows:



And the setting of Object C's "Read address" is as follows:



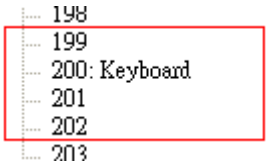
If you set INDEX3 to 20, reading the content of [LB100 + INDEX3] and [LB101 + INDEX3] will mean to read the content of [LB120] and [LB121]. Refer to the picture below.



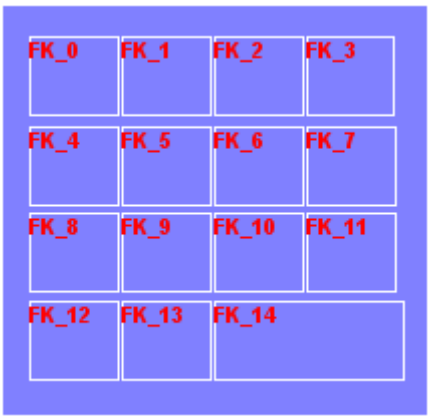
Chapter 12 Designing and Using Keypad

Both “Numeric Input” and “ASCII Input” have to use a keypad as an inputting tool. The following description shows how to design a keypad.

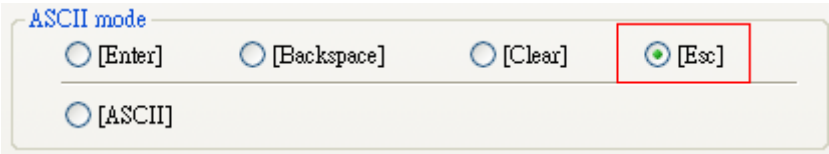
Step 1
Set up a window which is intended as a keypad and open it. For example, set WINDOW 200 as the window for a keypad.



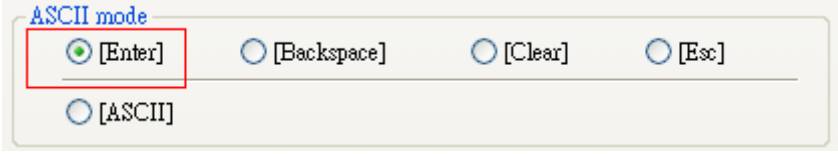
Step 2
Adjust the height and width of WINDOW 200 and on it set up a variety of objects as Function Keys. Different input signals will be made by pressing different Function Key objects.



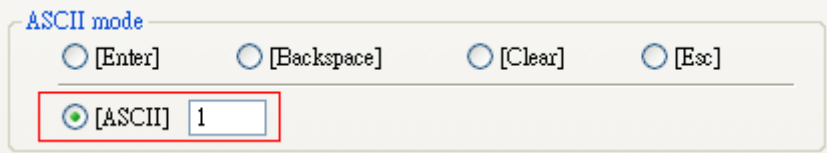
The Function Key objects on WINDOW 200 are arranged as shown in the picture above. It is a must to select [ASCII mode] to set up all of the Function Key objects. Among the objects, the FK_11 is used as the “Escape (Esc)” key. See the picture below for the setting.



And the FK_12 is used as the “ENTER” key. See the picture below for the setting.

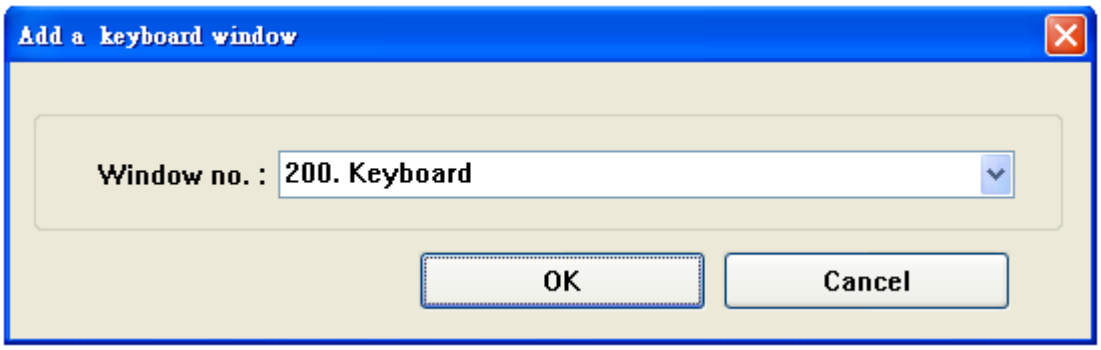


Most of the other Function Keys are used to input numbers or text. For example, the FK_0 is used to input the number “0”. See the picture below for the setting.

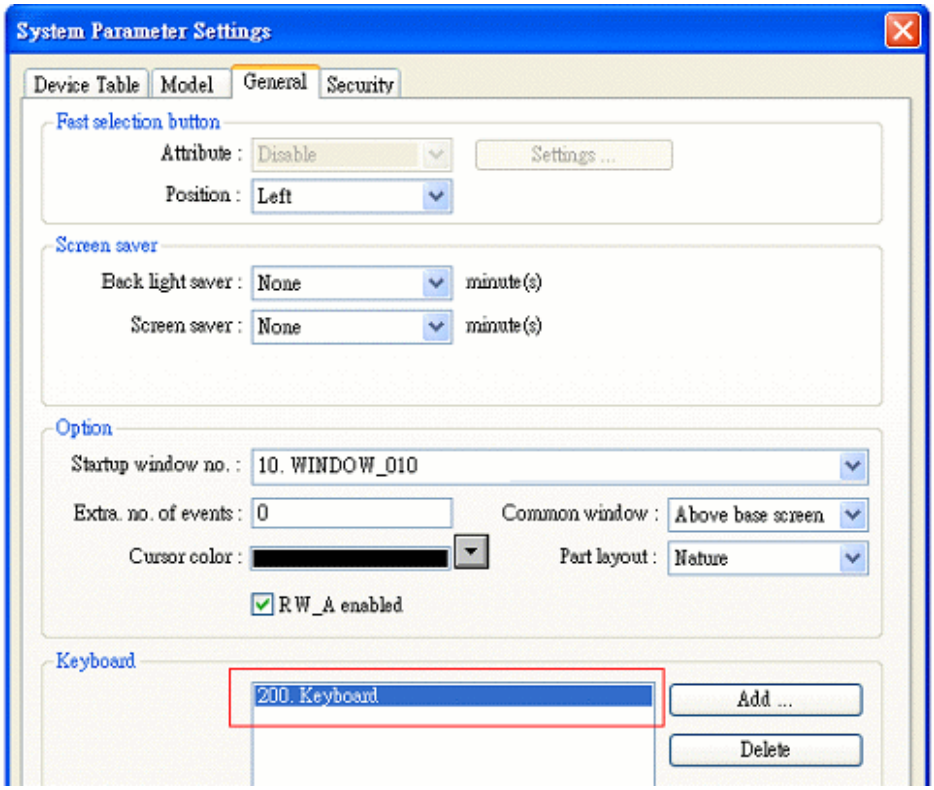


At last, select a proper Picture for each Function Key object, as shown in the picture below.

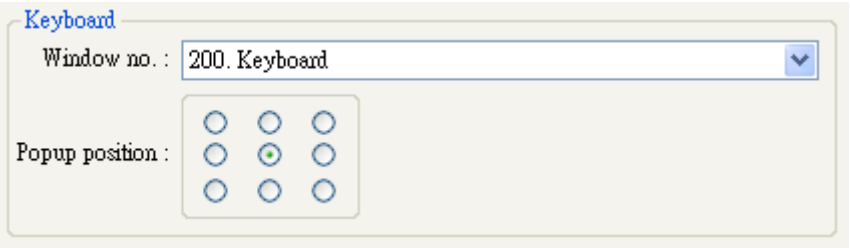
Step 3
Go to [General] tab in “System Parameter Settings” and click [Add…] in [Keyboard], a setting dialog box, as shown in the picture below, will be displayed, and then select WINDOW 200 and press “OK”.



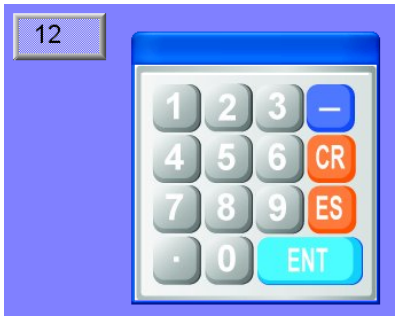
As shown in the picture below, a new item: “200.Keyboard” will be added to [Keyboard] in [General] tab in “System Parameter Settings.”



After completing all the steps described above, when users open the setting window of “Numeric Input” or “ASCII Input,” “200.Keyboard” can be found to add to [Window no] in [Keyboard] setting tab, as shown in the picture below. [Popup Position] can be used to set the displaying position of the keypad, and in this function, the EB8000 divides the screen into 9 areas. The top left-hand corner of the keypad will be placed in the top left-hand corner of the selected area.



After selecting “200.Keyboard,” when users press “Numeric Input” or “ASCII Input” objects, WINDOW 200 will pop up on the MT8000 screen. See the picture below, clicking the Function Key objects on the created keypad means the same thing of inputting information by using a physical keyboard.



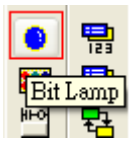
Chapter 13 Object

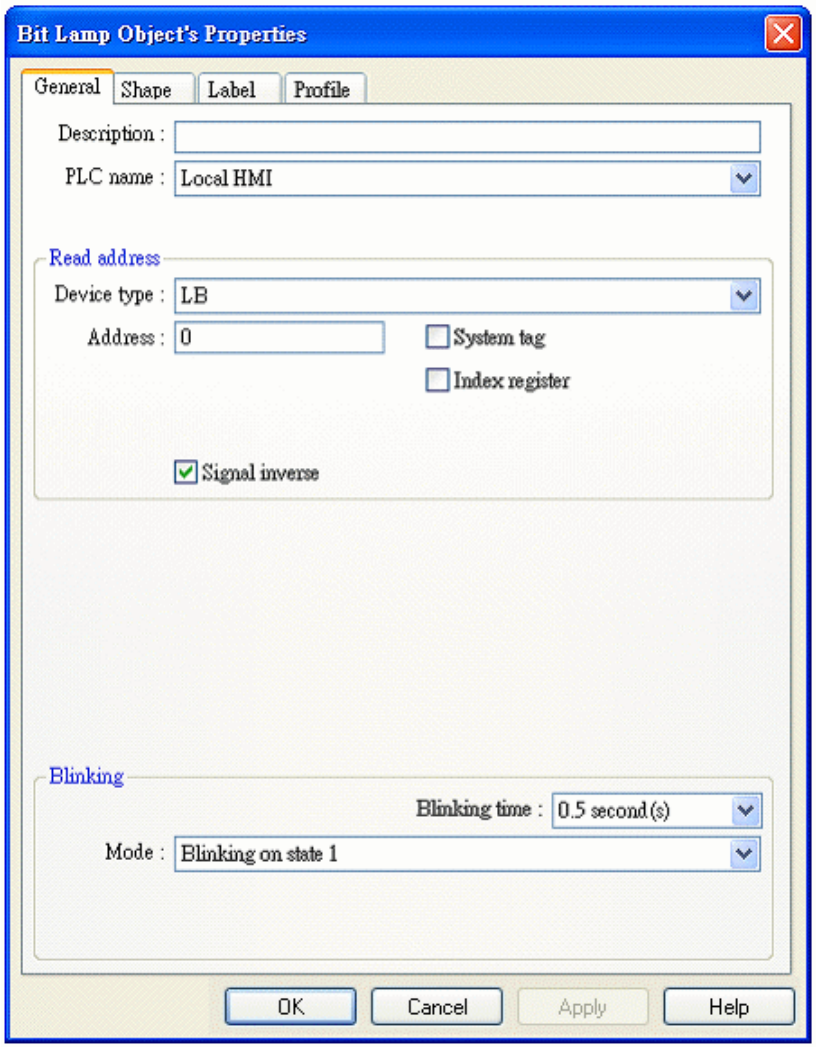
This chapter is to illustrate the ways of using and setting all kinds of objects, and information other than that provided in this chapter can be found in the chapter of “Object’s General Attributes” chapter.

Bit Lamp Object

Bit Lamp object displays the ON and OFF states of a designated bit address. If the bit state is OFF, the State 0 shape will be displayed. If the bit state is ON, the State 1 shape will be displayed

Click the “bit lamp” icon on the toolbar and the “Bit Lamp Object’s Properties” dialogue box will appear, then press the OK button after correctly setting each item on the “General” tab, and a new bit lamp object will be created. See the pictures below.





[Description]

A reference name (not displayed) that you assign to the Bit Lamp.

[PLC name]

Select the PLC that you want to operate.

Read address

The PLC's register address that controls the Bit Lamp object's states.

[Signal inverse]

Inverse displaying of present states; for example, in fact the present state is "OFF", but the object displays the "ON" shape.

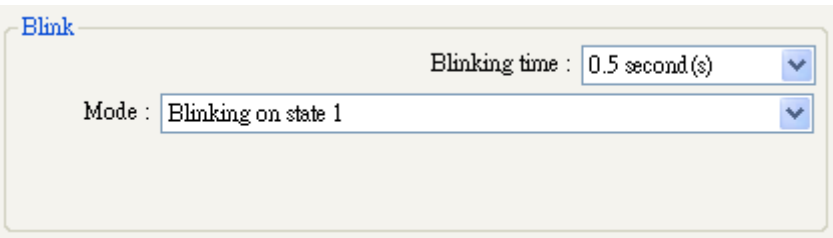
Blinking

The settings of blinking effect.

[Mode]

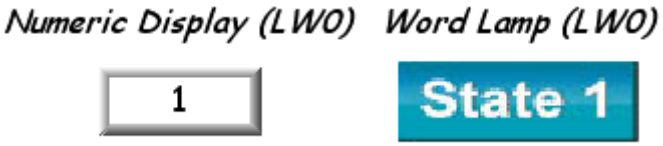
Blinking mode	Description
Normal	The Bit Lamp is displayed as the state of its shape/bitmap and /or labels.
Blinking on state 0	Enable the shape's blinking to alternate between state 0 and state 1 when the device address is OFF.
Blinking on state 1	Enable the shape's blinking to alternate between state 0 and state 1 when the device address is ON.
Blinking on state 0 (use state 0's graph)	The shape of state 0 blinks when the device address is OFF.
Blinking on state 1 (use state 1's graph)	The shape of state 1 blinks when the device address is ON.

When select the blinking effect, [Blinking time] is used to set the frequency of blinking.

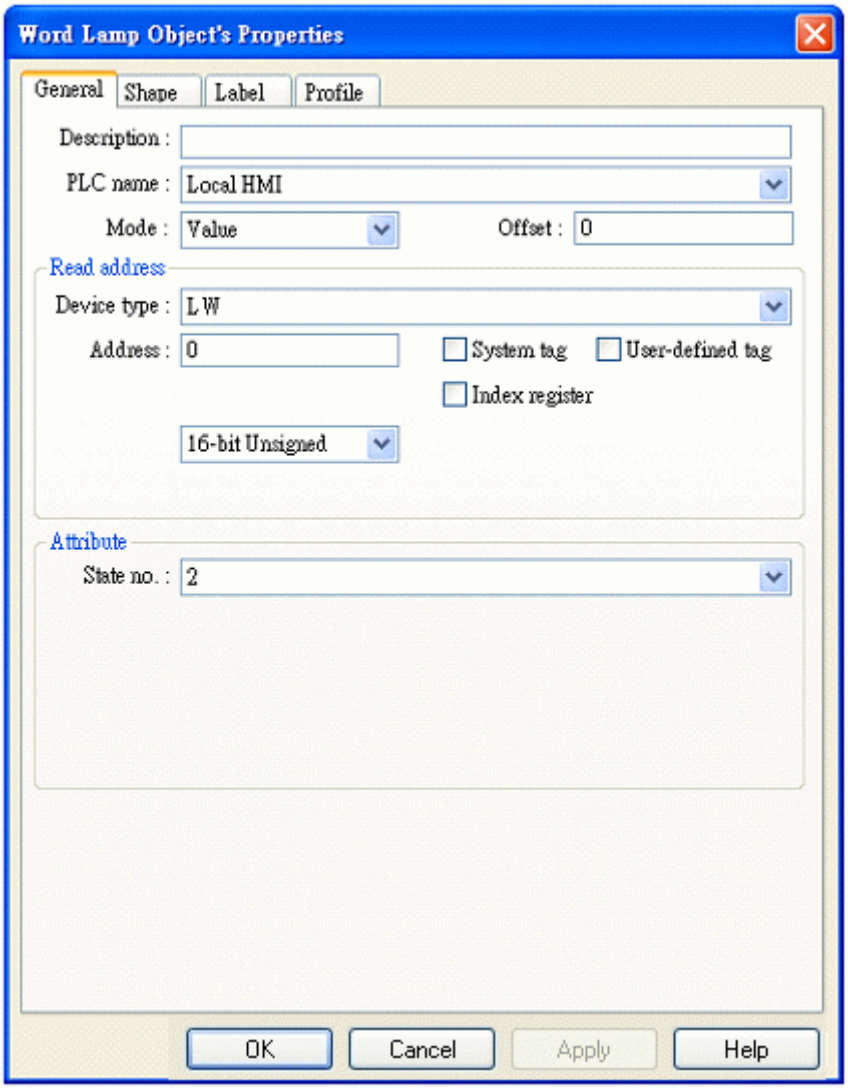


Word Lamp Object

A Word Lamp object changes the state and shows the corresponding shape according to the value in the designated word address. (The EB8000 supports a maximum of 256 states)



Click the “Word lamp” icon on the toolbar and the “Word Lamp Object’s Properties” dialogue box will appear, then press the OK button after correctly setting each item on the “General” tab, and a new word lamp object will be created. See the pictures below.

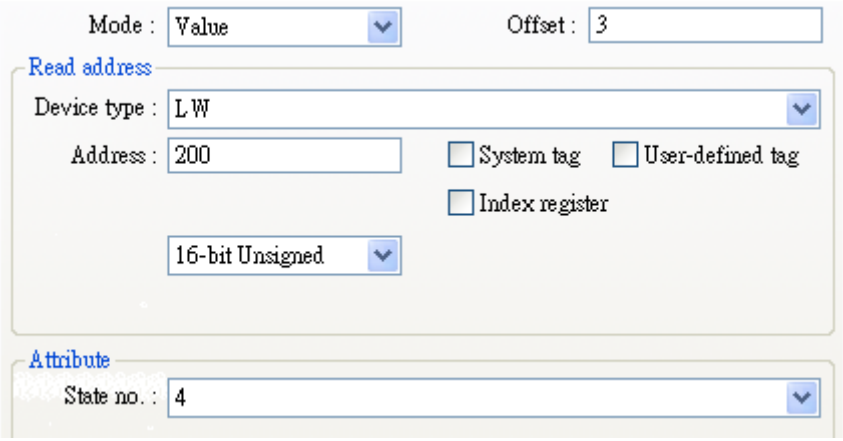


[Mode]

Word lamp object offers the following three modes for selection:

a. "Value" display mode

Directly using the result of the value of register subtracting the setting number of [Offset] as the object's current state. For example, add a new word lamp object, and the object's [Offset] number is 3. Refer to the picture below for related settings.



Therefore, if the value of [LW200] is 5, the state will show as 2 (= 5-3). See the picture below.

b. "LSB" display mode

In this mode, the value of the register will transfer to binary system first, and then the lowest bit other than value 0 will decide the current state. The following table shows an example of the register [LW200]:

Decimal System	Binary System	Displayed State
0	0000	All bits are 0, displaying the state 0
1	0001	The lowest bit other than 0 is bit 0, displaying the state 1
2	0010	The lowest bit other than 0 is bit 1,

		displaying the state 2
3	0011	The lowest bit other than 0 is bit 0, displaying the state 1
4	0100	The lowest bit other than 0 is bit 2, displaying the state 3
7	0111	The lowest bit other than 0 is bit 0, displaying the state 1
8	1000	The lowest bit other than 0 is bit 3, displaying the state 4

c. “Auto changed” display mode

The states of the object have nothing to do with the register. The object will change the states according to the fixed frequency. Users can use [Change time] to set the frequency.

Read address

The PLC’s register address that controls the Word Lamp object’s states.

Attribute

[State no.]

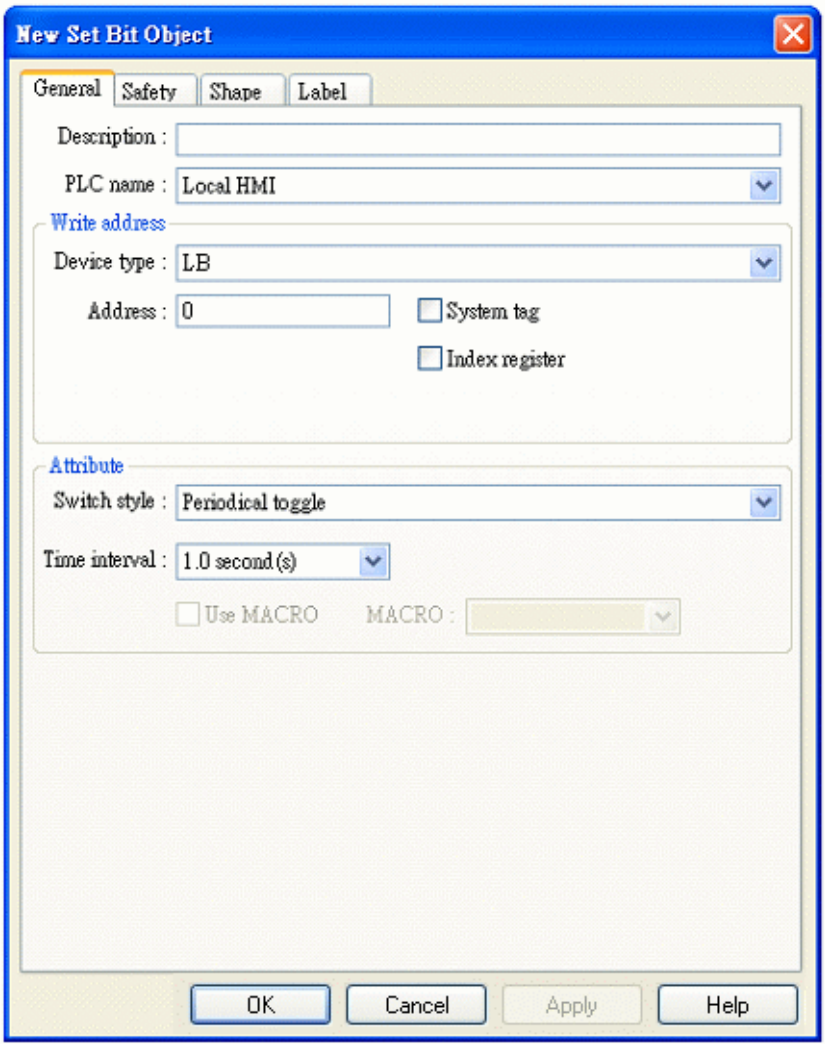
The number of the object's states. The state's serial number begins from 0, so the maximum state that can be showed is [State no.] - 1. Supposed that the number of the state is 8, and the states will be showed as 0, 1, 2,…, 7 in order. When the current state is beyond [State no.] - 1, the EB8000 will show the last state.

Set Bit Object

The Set Bit object provides two operation modes: the "manual operation" mode and the "automatic operation" mode. The Set Bit object can be used to define a touching area, and users can activate the area to set the state of the designated register to be ON or OFF.

When users select the "automatic operation" mode, the object's defined action will be automatically activated in some particular conditions. In the "automatic operation" mode, the object will not have any when the object's touching area is pressed.

Click the "Set Bit" icon on the toolbar and the "New Set Bit Object" dialogue box will appear, then press the OK button after correctly setting each item on the "General" tab, and a new Set Bit object will be created. See the pictures below.



Write address

The PLC's register address that controls the Set Bit object's states.

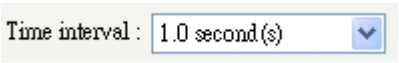
[Write when release this button]

When this function is selected, the object's defined action will be performed only after the pressing motion on the button is released completely. When the function is not selected, the object's defined action will be performed as soon as the touching area of the object is pressed. But when the "Momentary" switch is selected for the operation mode, the [Write when release this button] function will be disabled.

Attribute

[Switch Style]

To set the operation mode. The available modes for selection are listed as follows:

Set ON	In this mode, when the object is pressed, the state of the designated register will be set to ON.
Set OFF	In this mode, when the object is pressed, the state of the designated register will be set to OFF.
Toggle	In this mode, when the object is pressed, the state of the designated register will be set to the opposite, (i.e. ON → OFF or OFF → ON.
Momentary	In this mode, when the object is pressed, the state of the designated register will be set to the opposite; however, when the pressing motion stops, the state will resume as it was.
Periodical toggle	In this mode, the state of the designated register will be switched between ON and OFF periodically. Manual operation is not available in the mode, but operation's time interval can be selected in the combo box showed in the picture below: 
Set ON when open window	In this mode, when the window containing the Set Bit object is opened, the designated register will be automatically set to ON.

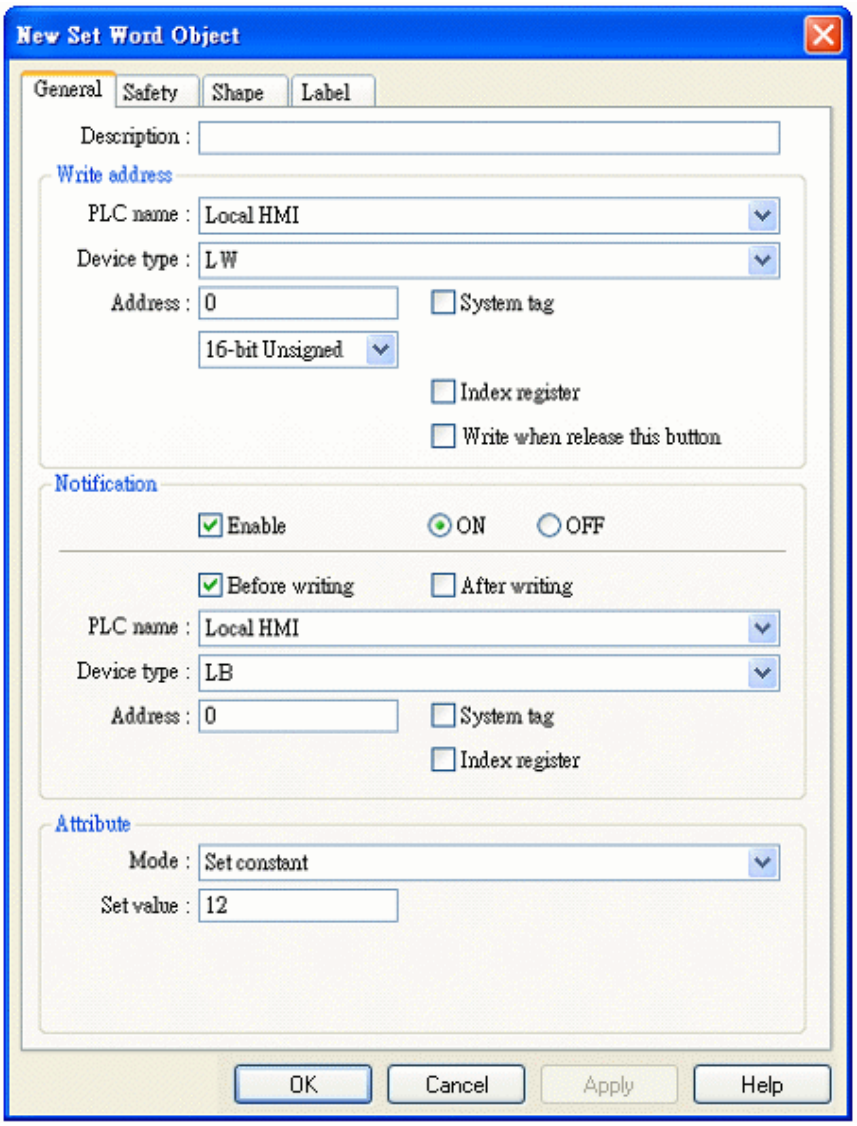
Set OFF when open window	In this mode, when the window containing the Set Bit object I opened, the designated register will be automatically set to OFF.
Set ON when close window	In this mode, when the window containing the Set Bit object is closed, the designated register will be automatically set to ON.
Set OFF when close window	In this mode, when the window containing the Set Bit object I closed, the designated register will be automatically set to OFF.

Set Word Object

The Set Word object provides two operation modes: the “manual operation” mode and the “automatic operation” mode. The Set Word object can be used to define a touching area, and users can activate the area to set the value of the designated register.

When users select the “automatic operation” mode, the object’s defined action will be automatically activated in some particular conditions. In the “automatic operation” mode, the object will not have any when the object’s touching area is pressed.

Click the “Set Word” icon on the toolbar and the “New Set Word Object” dialogue box will appear, then press the OK button after correctly setting each item on the “General” tab, and a new Set Word object will be created. See the pictures below.



Write address

The PLC's register address that controls the Set Word object's states.

[Write when release this button]

When this function is selected, the object's defined action will be performed only after the pressing motion on the object is released completely. When the function is not selected, the object's defined action will be performed as soon as the object is pressed.

Notification

When this function is selected, in the “manual operation” mode, the state of the designated register can be set at the same time as the operation is completed. There are **[ON]** and **[OFF]** for selection to set the state.

[Enable]

This is for selecting whether or not to use the function.

[Before writing]

To set the state of the designated register before writing.

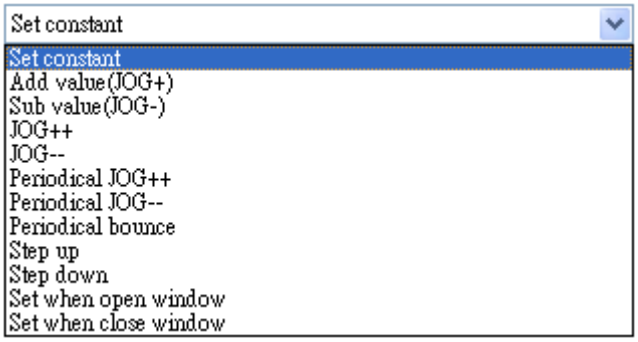
[After writing]

To set the state of the designated register after writing.

Attribute

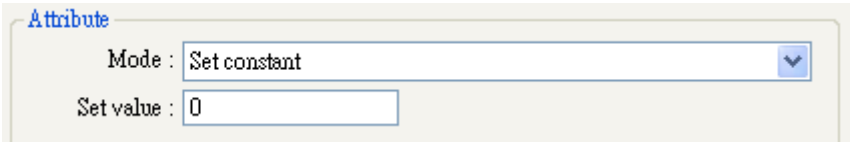
[Mode]

To set the operation mode. The available modes for selection are listed as follows:



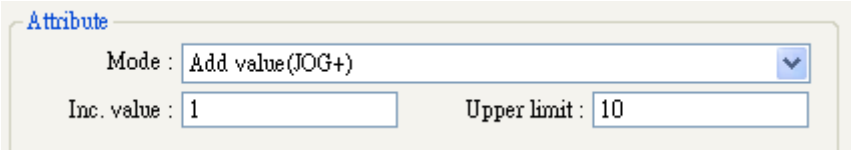
a. “Set const”

Constant setting function. Whenever the object is pressed, the value set in [Set value] will be written into the designated register. The constant’s style (16-bit BCD, 32-bit BCD, …) can be decided in “Write address”.



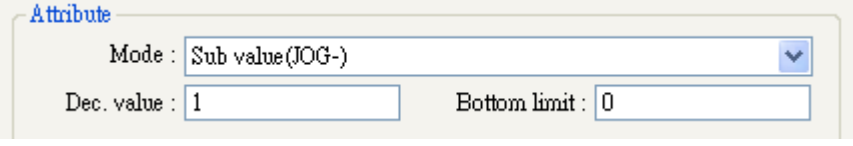
b. “Add value(JOG+)”

Value adding function. Whenever the object is pressed, the value set in [Inc. value] will be added to the value of the designated register, but the resulting value will not be larger than the value in [Upper limit].



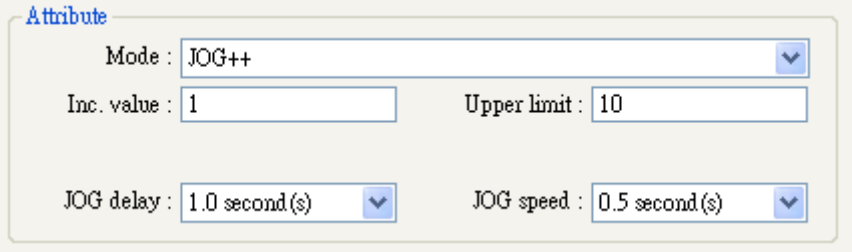
c. “Sub value(JOG-)”

Value subtracting function. Whenever the object is pressed, the value set in [Dec. value] will be subtracted from the value of the designated register, but the resulting value will not be smaller than the value in [Bottom limit].



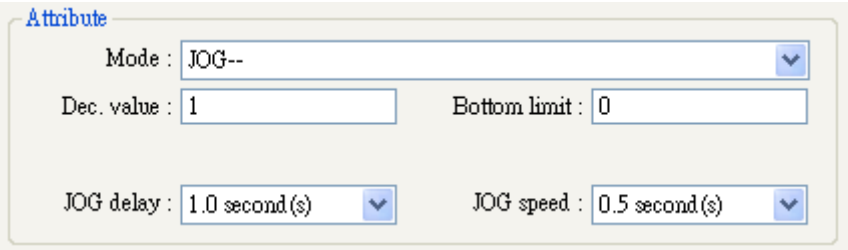
d. “JOG++”

Increasing function. When the time of the object being pressed is longer than the time set in [JOG delay], the value of the designated register will be added by the value set in [Inc. value] at the speed set in [JOG speed], but the resulting value will not be larger than the value in [Upper limit].



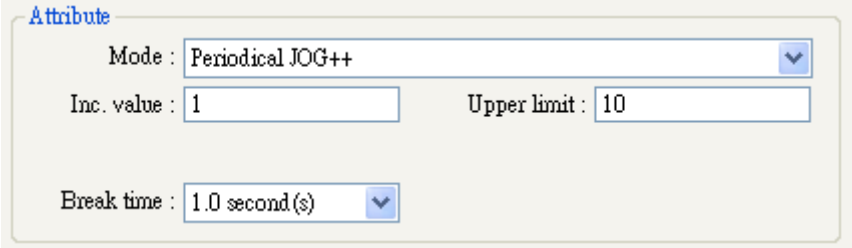
e. “JOG--”

Decreasing function. When the time of the object being pressed is longer than the time set in [JOG delay], the value of the designated register will be subtracted by the value set in [Dec. value] at the speed set in [JOG speed], but the resulting value will not be smaller than the value in [Bottom limit].



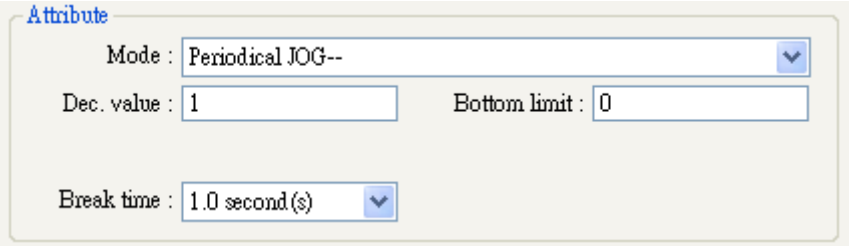
f. “Periodical JOG++”

Periodically increasing function. A set word object can use the interval set in [Break time] and the value set in [Inc. value] to automatically increase the value of the designated register, but the resulting value will not be larger than the value in [Upper limit].



g. “Periodical JOG--”

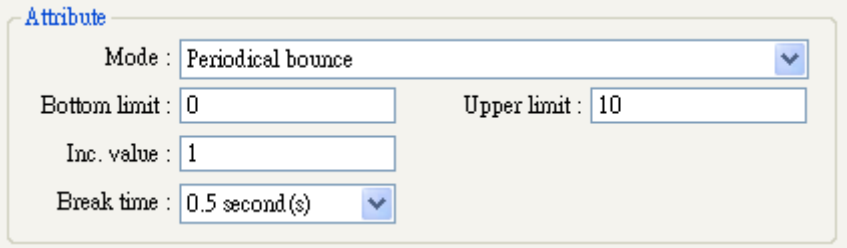
Periodically decreasing function. A set word object can use the interval set in [Break time] and the value set in [Dec. value] to automatically increase the value of the designated register, but the resulting value will not be smaller than the value in [Bottom limit].



h. “Periodical bounce”

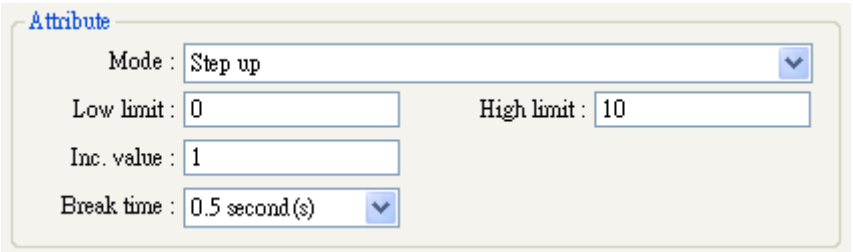
Periodically bouncing function. A Set word object will add the value set in [Inc. value] to the value of the designated register at the regular intervals set in [Break time] until the resulting value reaches the value in the [Upper limit], and then subtract the value set in [Inc. value] from

the value of the designated register at the same intervals until the resulting value reaches the value in the [Bottom limit]. In the example showed in the picture below, the value in the designated register will change periodically in order of 0, 1, 2.., 9, 10, 9, 8, 7,…, 1, 0, 1, 2……



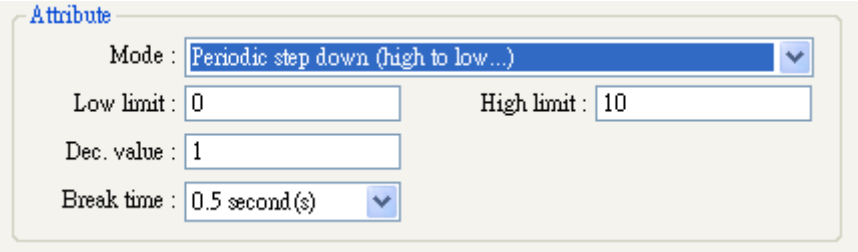
i. "Step up"

Stepping up function. A Set word object will add the value set in [Inc. value] to the value of the designated register at the regular intervals set in [Break time] until the resulting value reaches the value in the [Upper limit], and the value of the designated register will return to the value in the [Bottom value] and then repeat the action to keep the value in an active state. In the example showed in the picture below, the value in the designated register will change periodically in order of 0, 1, 2,…, 9, 10, 0, 1, 2, ……



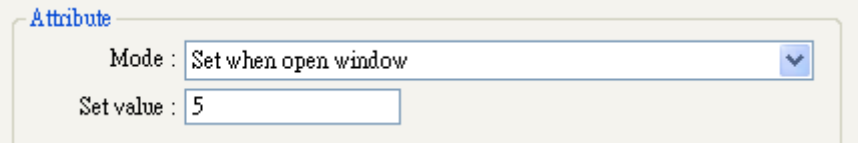
j. "Step down"

Stepping down function. A Set word object will subtract the value set in [Dec. value] from the value of the designated register at the regular intervals set in [Break time] until the resulting value reaches the value in the [Bottom limit], and the value of the designated register will return to the value in the [Upper value] and then repeat the action to keep the value in an active state. In the example showed in the picture below, the value in the designated register will change periodically in order of 10, 9, 8,…, 1, 0, 10, 9, 8, ……



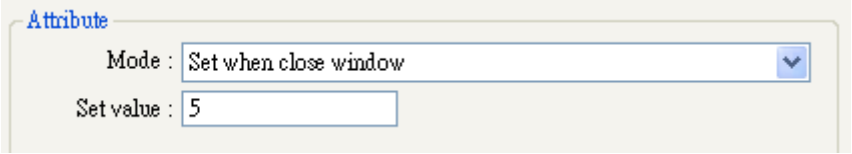
k. “Set when open window”

When the window containing the object is opened, the value set in [Set value] will be automatically written into the designated register.



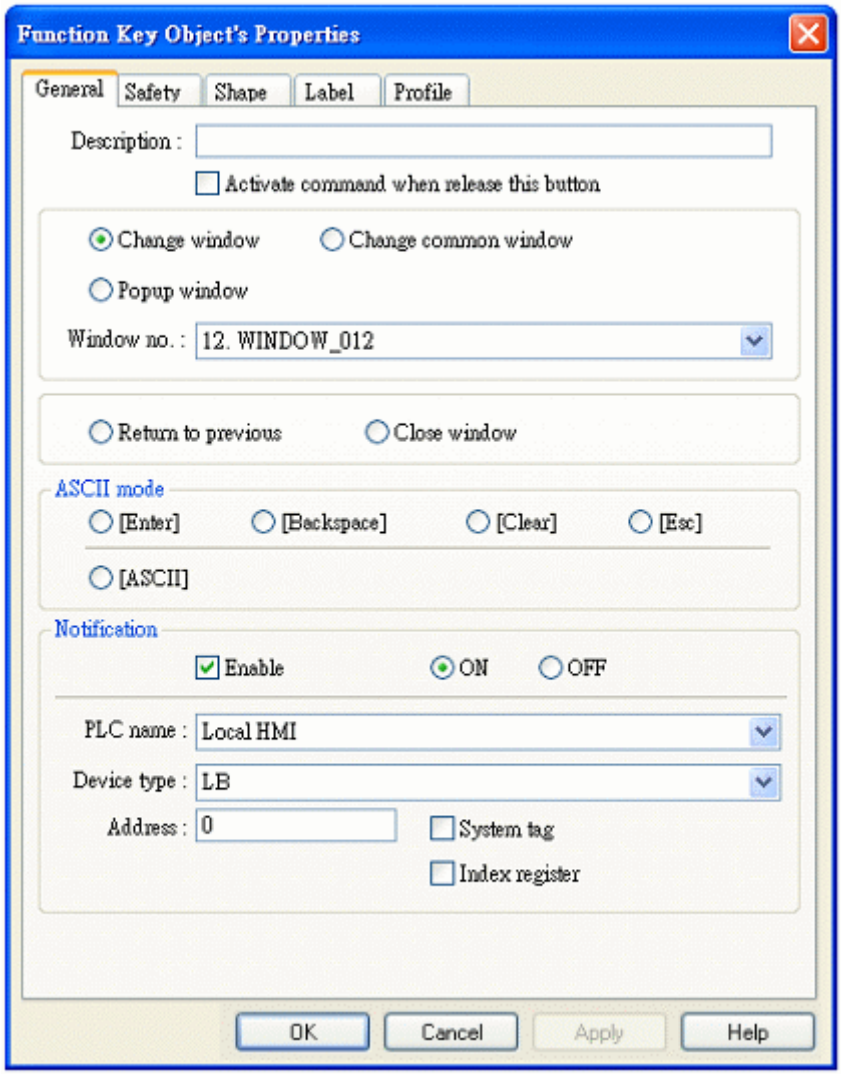
l. “Set when close window”

When the window containing the object is closed, the value set in [Set value] will be automatically written into the designated register.



Function Key Object

Function key object is used to change windows, call up windows and minimize or close windows. It can also be used to design the keypad buttons. Click the “Function Key” icon on the toolbar and the “Function Key Object’s Properties” dialogue box will appear, then press the OK button after correctly setting each item in the “General” tab, and a new function key object will be created. See the pictures below.



Function Key object provides the following operation modes:

[Activate command when release this button]

When the function is selected, the defined action will be performed only when the pressed the object is released completely. When the function is not selected, the defined action, for example, changing windows, will be performed immediately when the object is pressed.

[Change window]

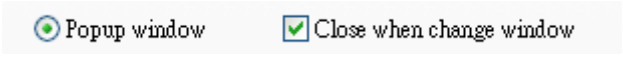
Change base window.

[Change common window]

Change common window; refer to the “windows” chapter for related information.

[Popup window]

Calling up other windows. The called-up window must be upper than the base window. The [Close when change window] function is available in this function, see the picture below; when the function is selected, the called-up window will disappear when changing window. Otherwise, users have to set a “Close” button on the called-up window to close the window.



[Window no.]

This is used to select the window no. when performing “change base window”, “change common window”, and “call up other window”

[Return previous]

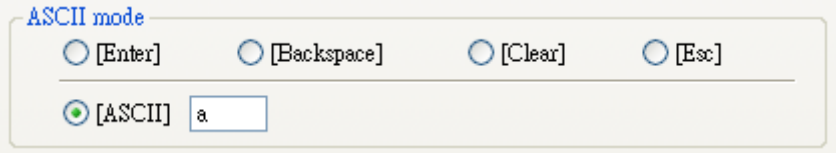
This is used to return to the previous base window. Fox example, when changing window 10 to window 20, users can use this function to return to window 10. This function is only available to base window.

[Close window]

Closing the called-up windows in the base window, including information windows and so on.

Items in ASCII mode

[ASCII mode] is used as input signals of keypad, mainly in occasions when numbers or text are needed to key in from the keypad for a numeric input object or an ASCII input object is in need is required for keypad input. Refer to the “Designing and Using Keypad” chapter for detailed information.



[Enter]

Same as the keyboard’s “enter” fuction.

[Backspace]

Same as the keyboard’s “backspace” fuction.

[Clear]

To clear the input data in the current numeric input object or ASCII input object.

[Esc]

Same as the [Close window] function. Both can be used to close the called-up keypad window.

[ASCII]

To set the characters that are input in the numeric input object and the ASCII input object. Digital characters such as 0,1,2… or ASCII characters like a,b,c,… etc. are available for selection.

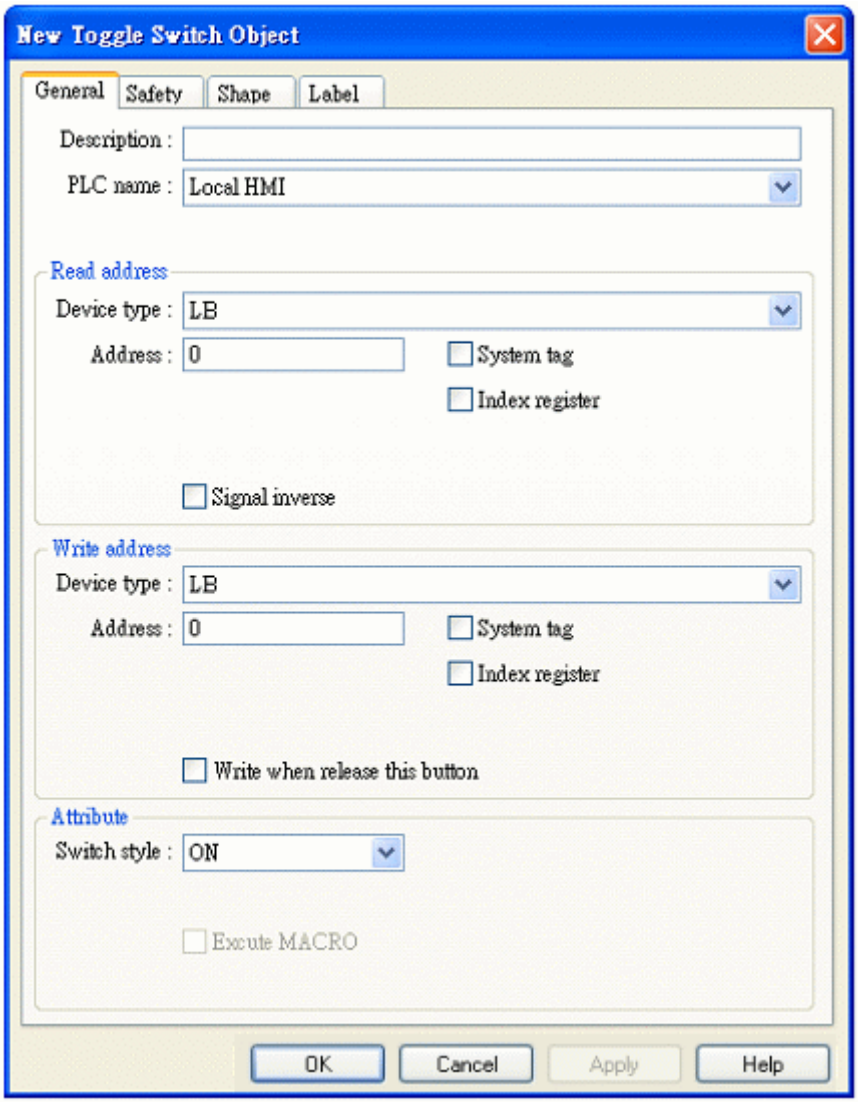
Notification

[Enable]

When the function is selected, the EB8000 will set the stated of the designated register after the action is completed. Use [ON] and [OFF] to select the state.

Toggle Switch Object

Toggle Switch object is a combination of bit lame object and set bit object. The object can be used not only to display the state of a register but also to define a touching area, and when the area is pressed, the state of the designed register will be set to “ON” or “OFF”. Click the “Toggle Switch” icon on the toolbar and the “New Toggle Switch Object” dialogue box will appear, then press the OK button after correctly setting each item in the “General” tab, and a new toggle switch object will be created. See the pictures below.



Read address

The PLC's register address that controls the Toggle Switch object's states.

Write address

The PLC's register address that is controlled by the Toggle Switch object's states. The register can be the same as or different from the register designated by the "Read address"

[Write when release this button]

Refer to the “Set Bit Object” section of this chapter for related information.

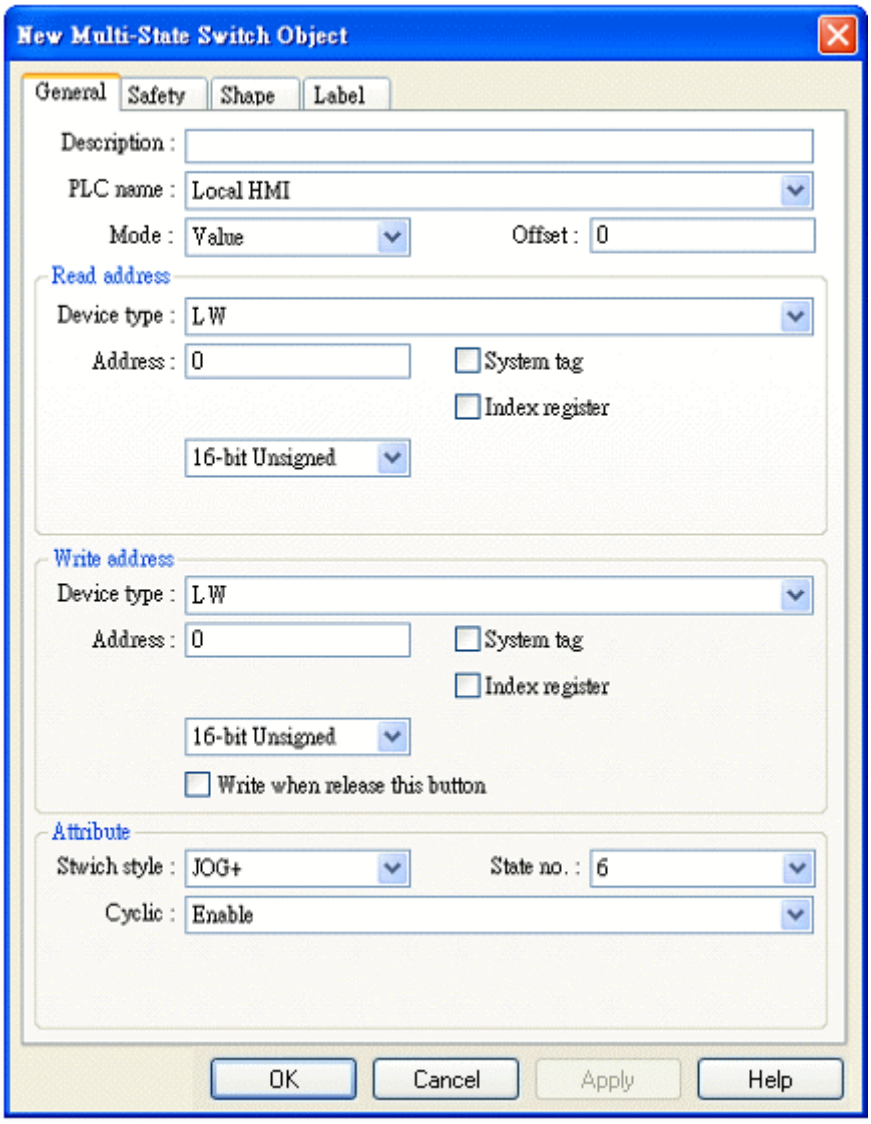
Attribute

This is used to select the operation mode. Available modes for selection include “Set ON”, “Set OFF”, ”Toggle”, and ”Momentary”. Refer to the illustrations in the “Set Bit Object” section of this chapter for related information.

Multi-Switch Object

Multi-State Switch object is a combination of word lamp object and set word object. The object can be used not only to display the state of a register according to the value but also to define a touching area in the window, and the value of the designed register can be set when the area is pressed.

Click the “Multi-State Switch” icon on the toolbar and the “New Multi-State Switch Object” dialogue box will appear, then press the OK button after correctly setting each item in the “General” tab, and a new Multi-State Switch object will be created. See the pictures below.



[Mode]

To provide “Value” and “LSB” display mode. Refer to the “Word Lamp Object” section of this chapter for related information.

[Offset]

It is used in the “Value” display mode. Refer to the “Word Lamp Object” section of this chapter for related information.

Read address

The PLC's register address that controls the Multi-State Switch object's states.

Write address

The PLC's register address that is controlled by the Multi-State Switch object's states. The register can be the same as or different from the register designated by the "Read address"

[Write when release this button]

Refer to the "Set Bit Object" section of this chapter for related information.

Attribute

To select the object's operation mode.

[Switch style]

There are "JOG+" and "JOG-" for selection. When the read address is the same as the write address, the minimum value of the designated register is [Offset](the current state is 0), and the maximum value is ([State no.] -1) + [Offset] (the current state is [State no.] -1). See the picture below.

a. “JOG+”

Whenever the Multi-State Switch object is pressed, the value of the designated write address will be added by 1. In the “Value” display mode, if the resulting value is equal to or larger than the value of [State no.] + [Offset] and “Enable” in [Cyclic] is selected, the value of the register will return to [Offset] and show the state 0; otherwise the value of the register will maintain as ([State no.] – 1) + [Offset] and show the state ([State no.] – 1).

Note: Like the word lamp object, the state showed by Multi-State Switch object is the value of the designated register that subtracts [Offset].

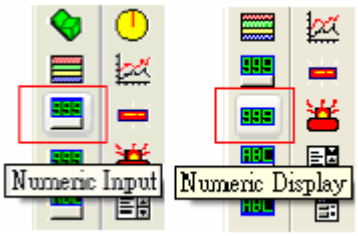
b. “JOG-”

Whenever the Multi-State Switch object is pressed, the value of the register designated in “write address” will be subtracted by 1. In the “Value” display mode, if the resulting value is smaller than the value of [Offset] and “Enable” in [Cyclic] is selected, the value of the register will change to ([State no.] – 1) + [Offset] and show the state ([State no.] – 1); otherwise the value of the register will maintain as [Offset] and show the state 0.

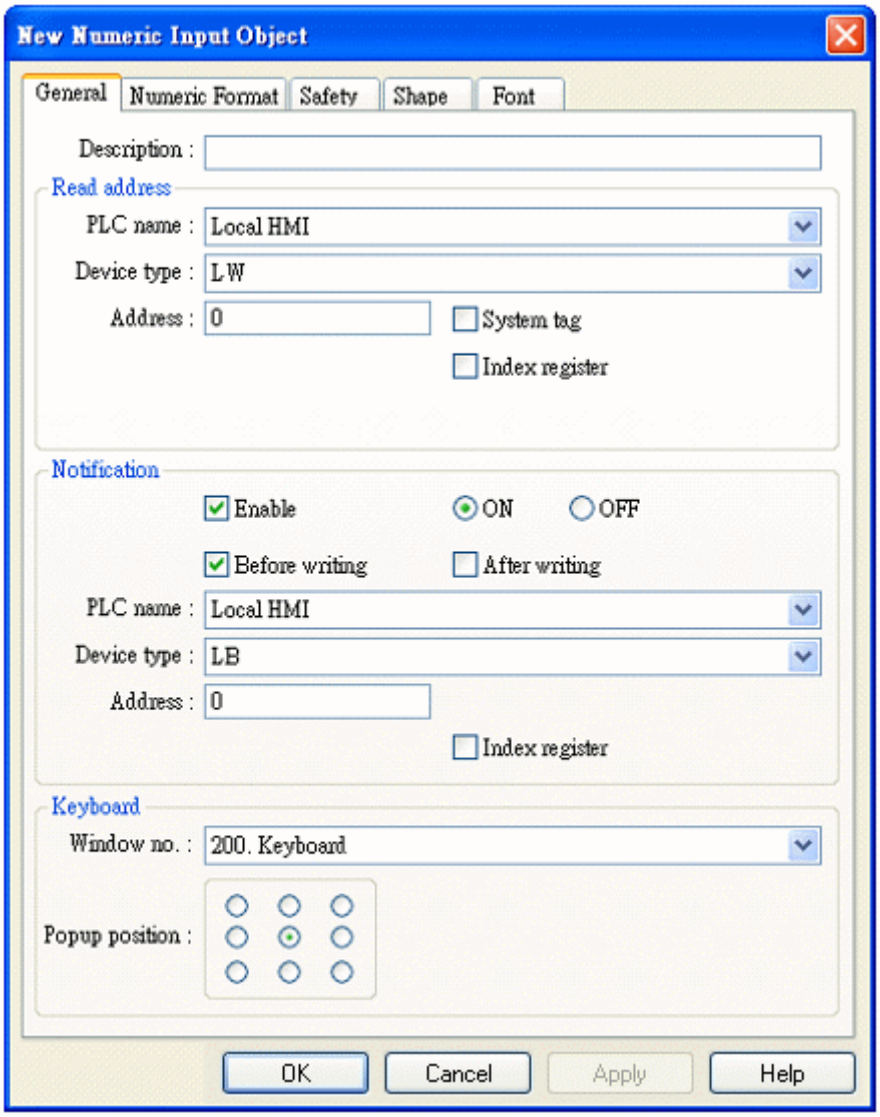
Numeric Input and Numeric Display Objects

Both of the Numeric Input object and the numeric display object can be used to display the value of the designated register. Besides, the numeric input object can also use the value input by the keypad to change the value of the designated register.

Click the “numeric input” or “numeric display” icon on the toolbar and the “New Numeric Input Object” or “New Numeric Display Object” dialogue box will appear, then press the OK button after correctly setting each item in the “General” tab, and a new “Numeric Input Object” or “Numeric Display Object” will be created. See the pictures below.



The difference between the “New Numeric Input Object” and “New Numeric Display Object” dialogue boxes is that the latter has the settings for ”Notification” and keypad input while the former doesn’t have. The picture below shows the [General] tab in “New Numeric Display Object.”



Read address

The PLC's register address that controls the Numeric Input object's (or the numeric display object's) states.

Notification

When the settings in "Notification" are used, it is able to set the state of the designated register, using [ON] and [OFF] to select the state, after the value of the register is changed successfully (the input value must be limited to the defined range, refer to the "Numeric Format" section for related information.).

[Enable]

To decide whether or not to use the function.

[Before writing]

To set the state of the designated register before the value of the register is changed.

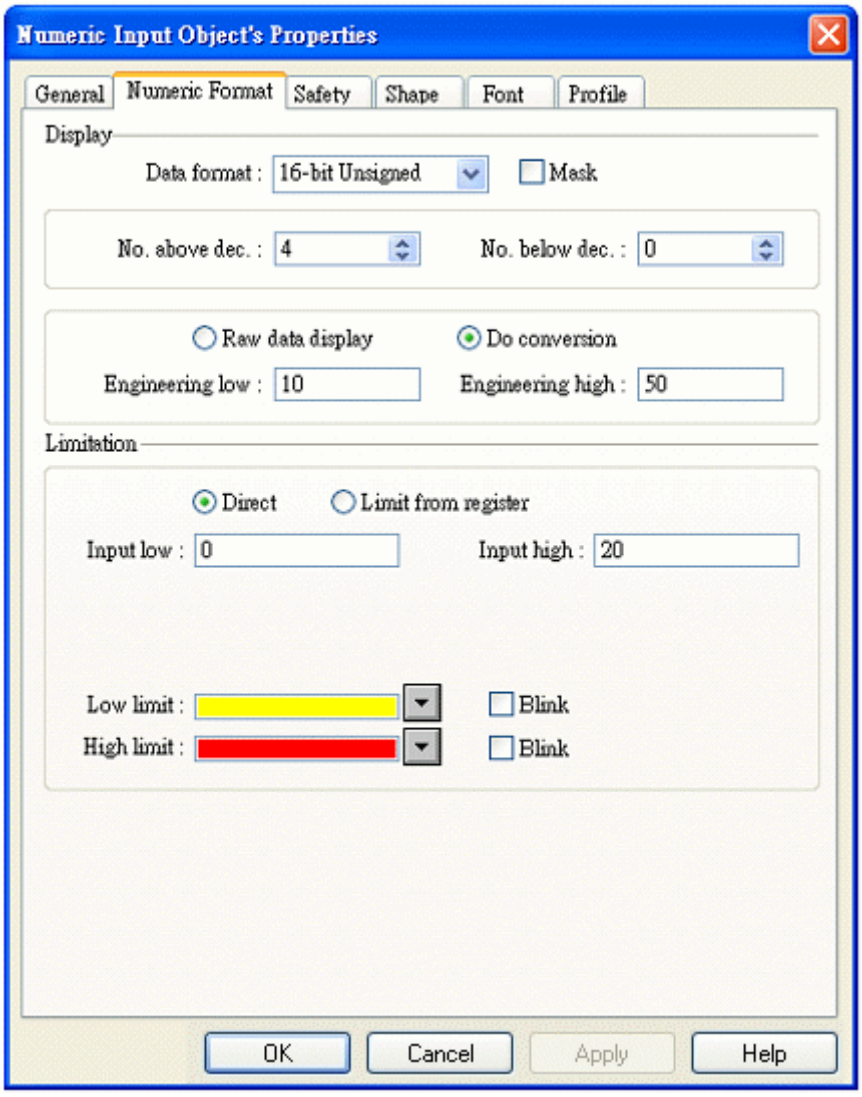
[After writing]

To set the state of the designated register after the value of the register is changed.

Keyboard

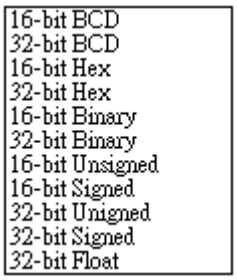
When using the Numeric Input Object, users are allowed to select the keypad style. Users need to select the window where the keypad will be displayed and set the displaying position of the keypad. When the Numeric Input object is touched, the keypad will appear automatically. Refer to the “Designing and Using Keypad” chapter for further information.

The picture below shows the [Numeric Format] tab, included in both of the numeric input object and the numeric display object, for setting the data display mode.



[Data format]

To select the data format type of the PLC's register designated by the "Read address". The available types for selection are listed as follows:



[Mask]

When the data is displayed, “*” will be used to replace all digitals and the color warning function will be cancelled.

[No. above dec.]

The number of places before the decimal point.

[No. below dec.]

The number of places after the decimal point.

[Raw data display]

To display the raw data of the PLC’s register designated by the “Read address”.

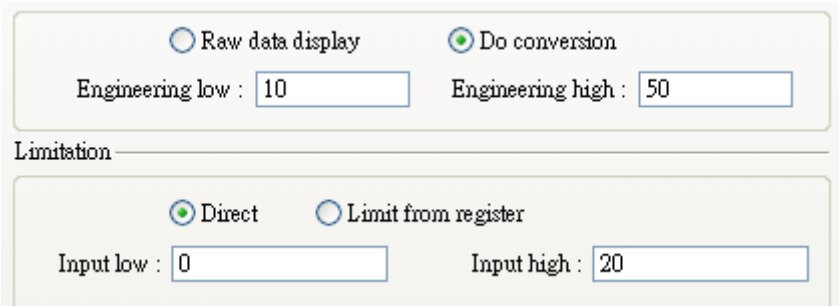
[Do conversion]

The displayed data is the result of processing the raw data of the PLC’s register designated by the “Read address.” When the function is selected, it is necessary to set [Engineering low], [Engineering high], and [Input low] and [Input high] in the “Limitation”. Supposed that “A” represents the raw data and “B” represents the displayed data, and the converting formula expression can be:

B = [Engineering low] + (A - [Input low]) * ratio

In above, the ratio = ([Engineering high] - [Engineering low]) / ([Input high] - [Input low])

See the example in the picture below, the raw data is 15, after being converted by the above formula as 10 + (15 – 0) * (50 – 10) / (20 - 0) = 40, and 40 of the resulting data will be displayed on the numeric input object.



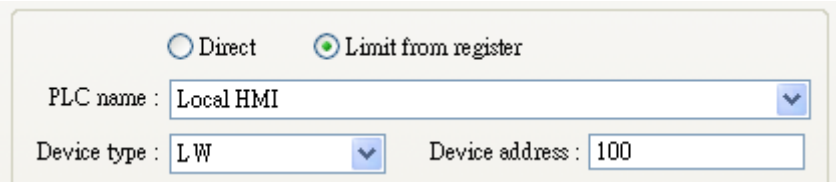
Limitation

To set the source of the range for the input data and to set the warning color effect.

[Direct]

The low limit and high limit of the input data can be set in [Input low] and [Input high] respectively. If the input data is out of the defined range, it is not able to change the value of PLC’s register designated by the “Read address”.

[Limit from PLC]



Set the low limit and high limit of the input data to be sourced from the designated register. The data length of the designated register is related to the object's data displaying type. In the above example, the low limit and high limit are sourced from [LW100] and the following explains the addresses of the low limit and high limit.

a. If the displayed data's format type is "32-bitBCD", then

   [LW100] low limit position (32-bit BCD)

   [LW100 + 2] high limit position (32-bit BCD)

b. If the displayed data's format type is "16-bit unsigned", then

   [LW100] low limit position (16-bit unsigned)

   [LW100 + 1] high limit position (16-bit unsigned)

c. If the displayed data's format type is "32-bitfloat", then

   [LW100] low limit position (32-bit float)

   [LW100 + 2] high limit position (32-bit float)

[Low limit]

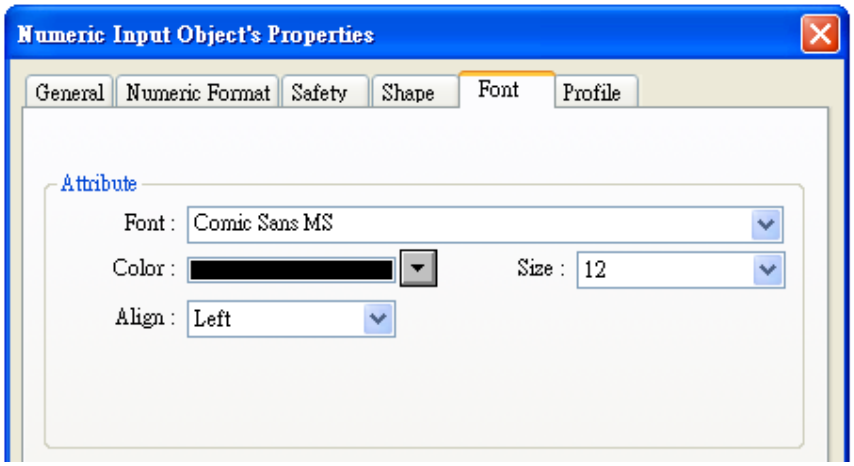
When the value of the PLC's register is smaller than [Low limit], the object will display data in the defined color.

[High limit]

When the value of the PLC's register is larger than [High limit], the object will display data in the defined color.

[Blink]

When the value of the PLC's register is smaller than [Low limit] or larger than [High limit], the object will use the Blink effect as warning. The picture below shows the [Font] tab, available in both of the numeric input object and the numeric display object, for setting the data's displaying font, font size and color, and aligning mode.

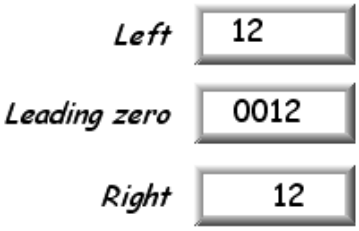


[Color]

When the data is in the defined range, they will be displayed in the defined color.

[Align]

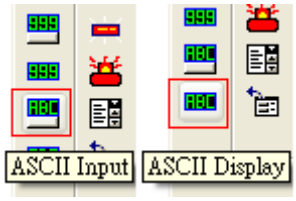
There are three aligning modes: "Left", "Leading zero", and "Right". The picture below shows how each mode performs.



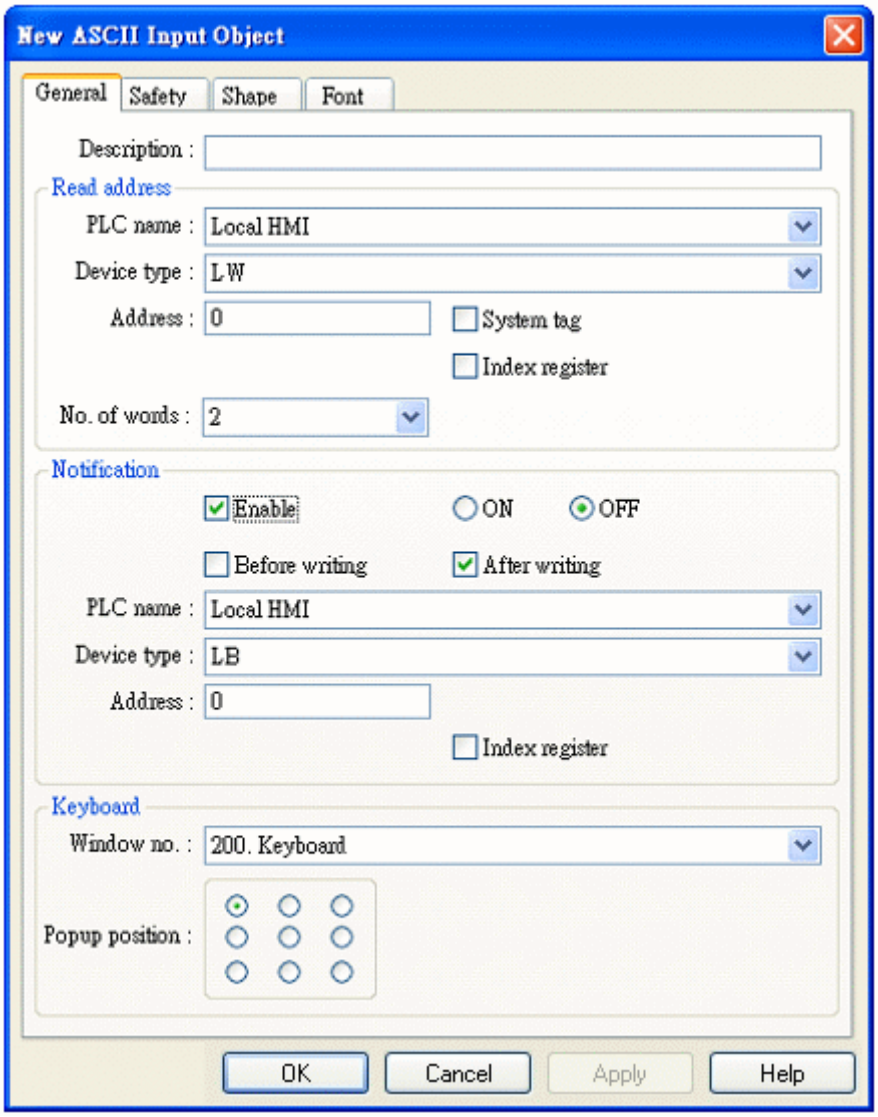
ASCII Input and ASCII Display Objects

Both of the ASCII input object and the ASCII display object can display the value of the designated PLC register in the ASCII mode. Besides, the ASCII input object can also use the value input by the keypad to change the value of the designated PLC register.

Click the “ASCII Input” or “ASCII Display” icon on the toolbar and the “New ASCII Input Object” or “New ASCII Display Object” dialogue box will appear, then press the OK button after correctly setting each item in the “General” tab, and a new “ASCII Input Object” or “ASCII Display Object” will be creased. See the pictures below.



The difference between the “New ASCII Input Object” and “New ASCII Display Object” dialogue boxes is that the latter has the settings for “Notification” and keypad input while the former doesn’t have. The picture below shows the [General] tab in the “New ASCII Input Object.”

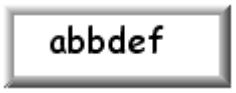


Read address

The PLC's register address that is displayed and modified by the ASCII Input.

[No. of words]

To set the maximum of displayed data length; the unit is word and the minimum length can be set for 1. Because the length of each ASCII character is one byte, it will display 2 characters at least every time. In the example shown in the pictures below, the object can display 3 * 2 = 6 characters the most.



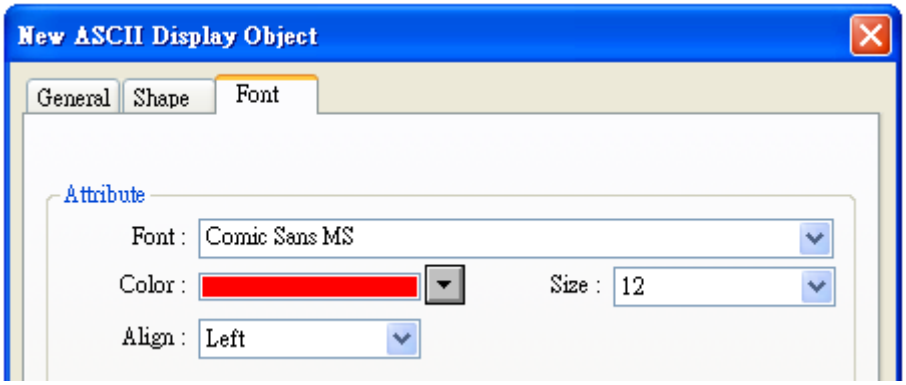
Notification

Refer to the “numeric input” section of this chapter for related information.

Keyboard

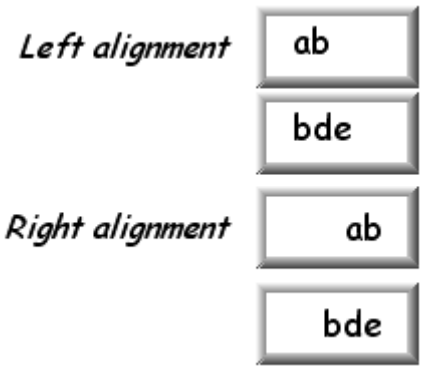
Refer to the “numeric input” section of this chapter for related information.

The picture shows the [Font] tab of the ASCII Input object and the ASCII display object. Users can set the data’s displaying font, font size and color, and aligning mode.



[Align]

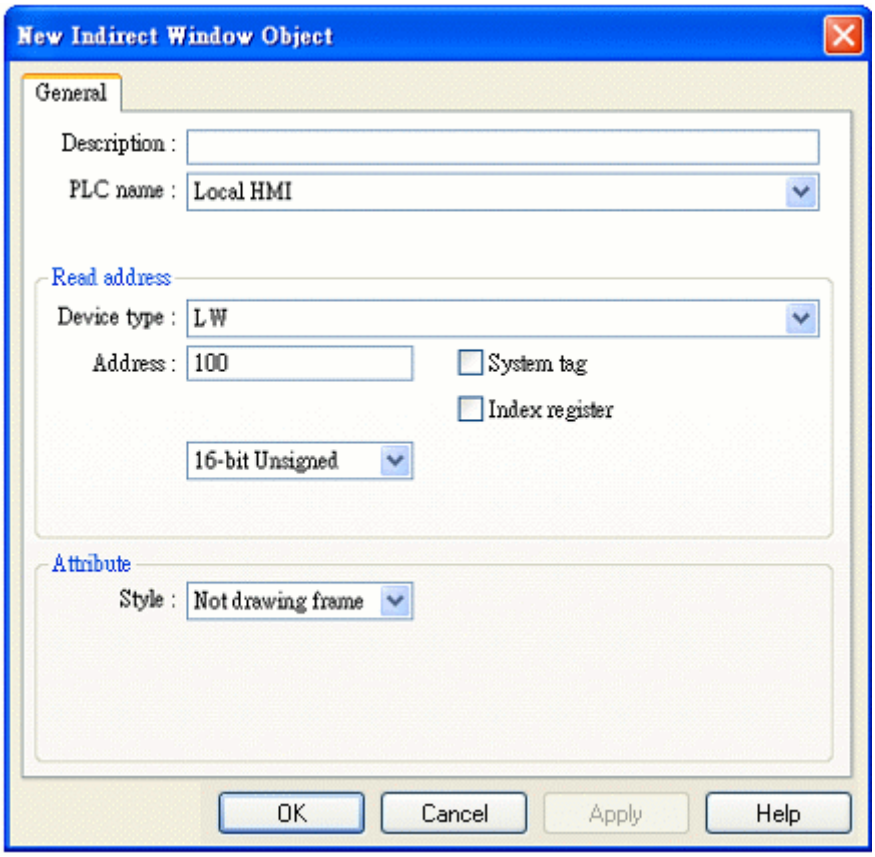
There are two aligning modes: “Left” and “Right”. The picture below shows how each mode performs.



Indirect Window Object

Indirect window Object can define a display area in a window, and after the definition of a register is completed and when the value of the designated register is the same as the number of the defined window, the window will popup in the defined display area. The size of the popup window will not be larger than the display area. The popup window can be closed when the value of the designated register is set for 0.

Click the “indirect window” icon on the toolbar and the “New Indirect Window Object” dialogue box will appear, the press the OK button after correctly setting each item in the “General” tab, and a new “Indirect Window Object” will be created. See the pictures below.



Read address

To set the register as the source for the window's number.

Attribute

[Style]

To set the displaying style of the popup window. There are two styles, "No drawing frame" and "Drawing frame" for selection.

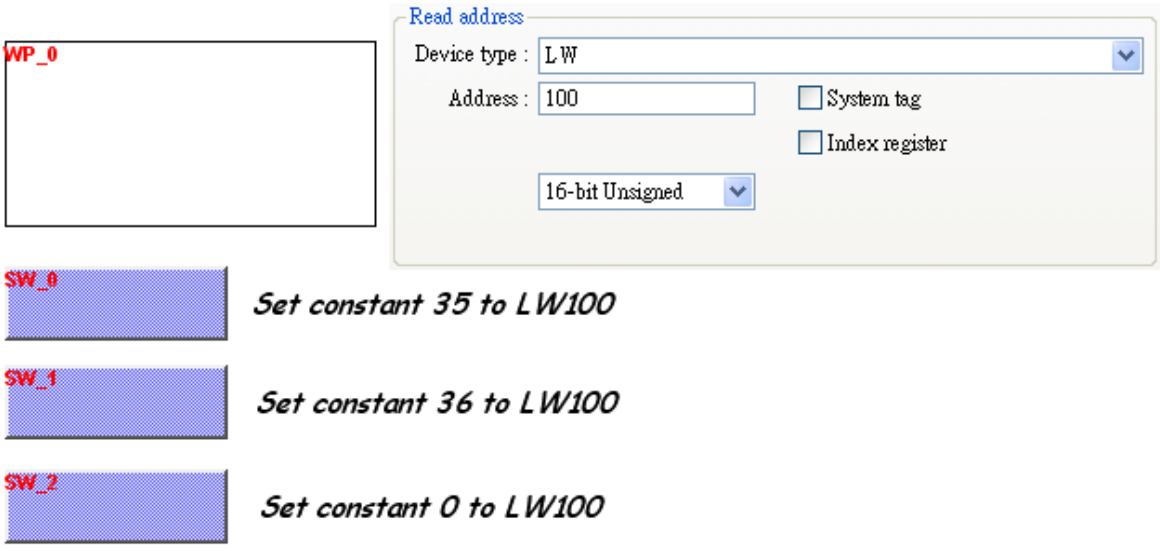
a. **"No drawing frame"**

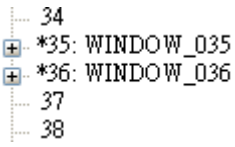
The popup window does not have title bar, and its position is not movable.

b. “**Drawing frame**”

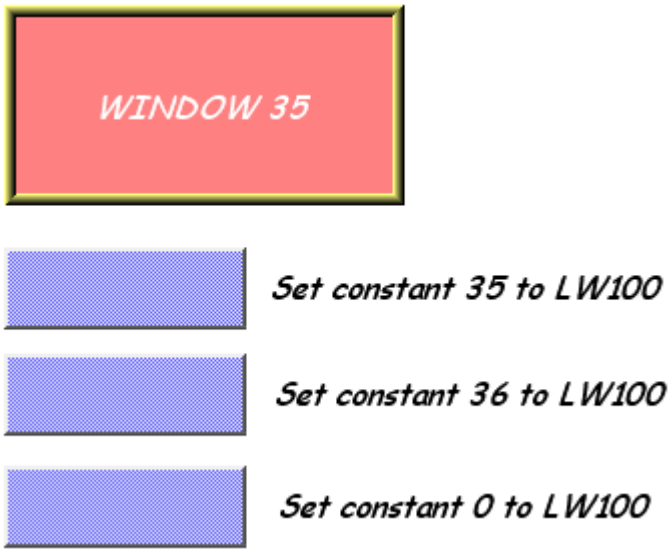
The Popup window possesses title bar, and its position is movable.

Here is a simple example to explain how to use the indirect window object. The pictures below show how to set the indirect window object. Use the register [LW100] to appoint the number of the window which is going to popup, and the window 35 and window 36 must have been created first.

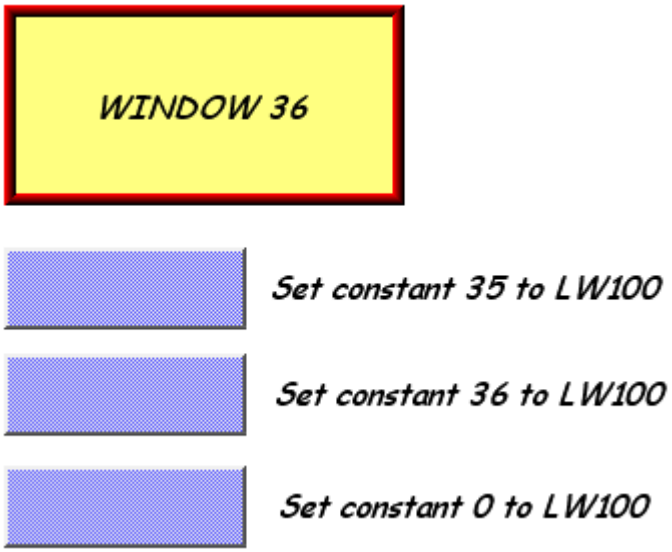




Use the set word object SW_0 and set the value of [LW100] to 35, and the display will be like the picture below.



If continue to use the set word object SW_1 and set the value of [LW100] to 36, the window 35 will be closed and the window 36 will be popped up. See the picture below.



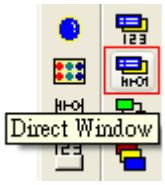
If want to close window 35 or window 36, besides using the set word object SW_2 to set the value of [LW100] to 0, users can set a function key object on window 35 and window 36 and select the [Close window] mode, and the popup window can be closed when pressing the object.

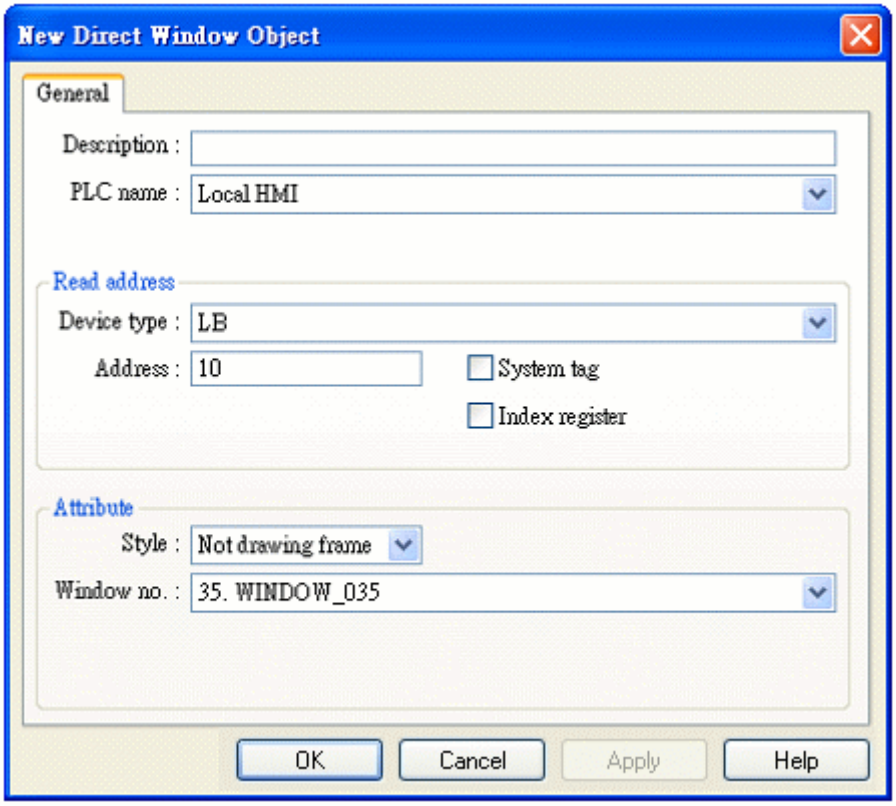
Direct Window Object

Direct window Object can be used to define a display area in a window, when the state of the designated register is changed from OFF to ON, the designated window will popup in the display area. The size of the popup window will not be larger than the display area. The popup window can be closed when the state of the designated register is changed from ON to OFF.

The difference between the “Direct window” and the “Indirect window” is that the direct window object sets the popup window in advance. When system is in operation, users can use the state of the designated register to decide whether to popup the window or to close the window.

Click the “Direct window” icon on the toolbar and the “New Direct Window Object” dialogue box will appear, then press the OK button after correctly setting each item in the “General tab, and a new “Direct Window Object” will be created. See the pictures below.





Read address

When the designated register's state is ON, the selected window (It is window 35 in the picture above) will be displayed in the defined area. When the state is OFF, the window will be closed.

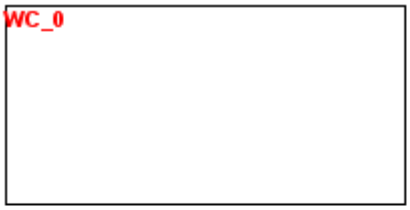
Attribute

[Style]

Refer to the "Indirect Window Object" section of this chapter for related information.

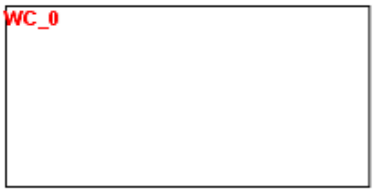
[Window no.]

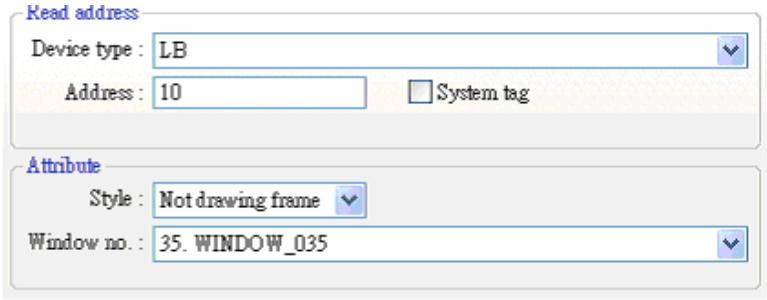
To set the popup window number.



Toggle Switch
Read address : LB10, Write address :LB10
Mode : "Toggle"

Here is an example to explain how to use the direct window object. The picture below show the settings of the direct window object. In the example, use [LB10] to [LB10] to call up the window 35.





Toggle Switch
Read address : LB10, Write address :LB10
Mode : "Toggle"

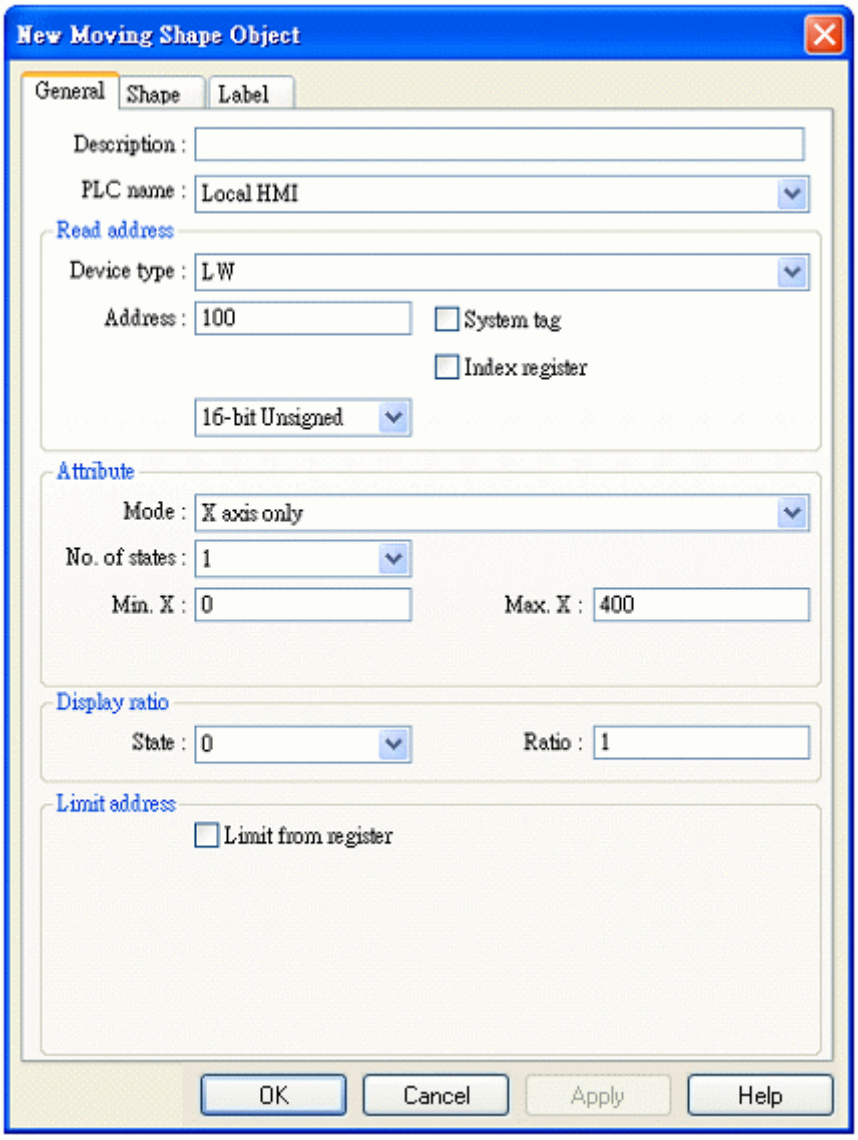
When the state of LB10 is to ON, the window 35 will popup; when the state of LB10 is OFF, the window 35 will disappear. See the picture below.

Toggle Switch
Read address : LB10, Write address :LB10
Mode : "Toggle"

Toggle Switch
Read address : LB10, Write address :LB10
Mode : "Toggle"

Moving Shape Object

Moving Shape object is used to define the object's state and moving distance. Click the "Moving Shape" icon on the toolbar and "New Moving Shape Object" dialogue box will appear, then press the OK button after correctly setting each item in the "General" tab, and a new "Moving Shape Object" will be created. See the pictures below.



Read address

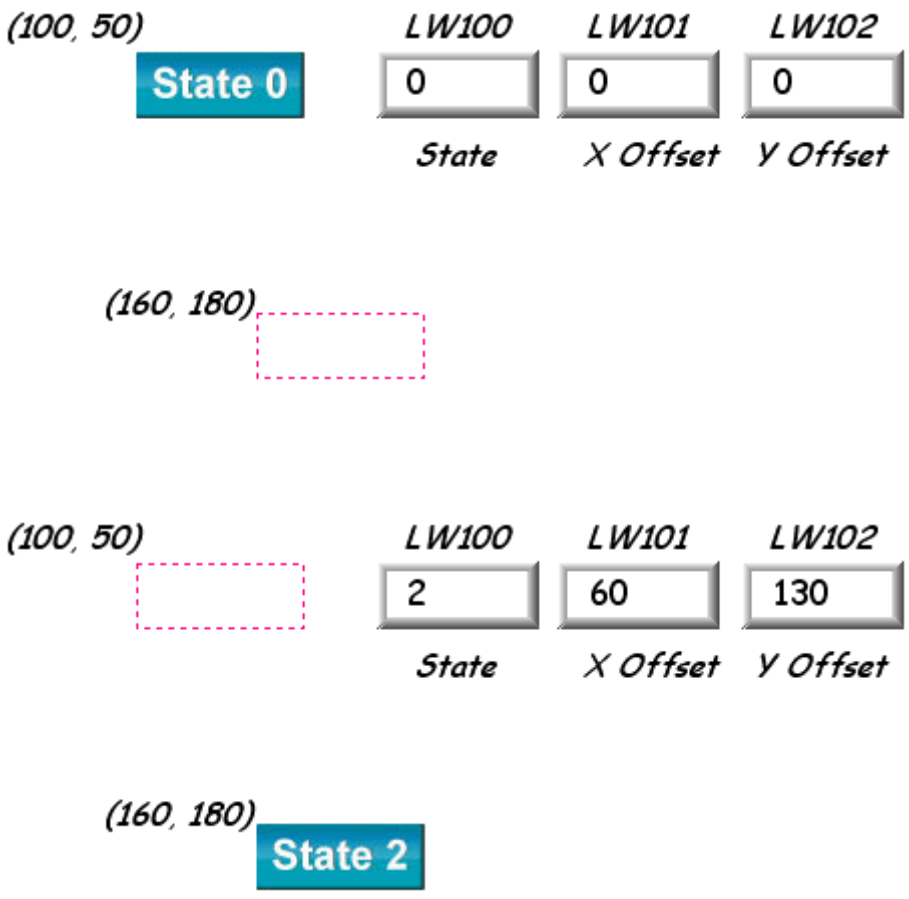
The PLC's register address that controls the object's state and moving distance. The table below shows the read address of object's states and moving distance.

Data format	Read address of object's state	Read address of Moving Distance on the X-axis	Read address of Moving distance on the Y-axis
16-bit BCD	Address	Address + 1	Address + 2
32-bit BCD	Address	Address + 2	Address + 4
16-bit Unsigned	Address	Address + 1	Address + 2
16-bit Signed	Address	Address + 1	Address + 2
32-bit Unsigned	Address	Address + 2	Address + 4
32-bit Signed	Address	Address + 2	Address + 4

For example, if the register's address is [LW100] and the data format is "16-bit Unsigned", [LW100] is to save the object's state, [LW101] is to save the object's moving distance on the X-axis, and [LW102] is to save the object's moving distance on the Y-axis.

The picture below shows that the object's read address is [LW100] and initial position is (100, 50). Supposed that the object is moved to the position (160,

180) and display the shape of State 2, the value of [LW100] must be set to 2, [LW101] = 160-100 = 60, [LW102] = 180-50 = 130.

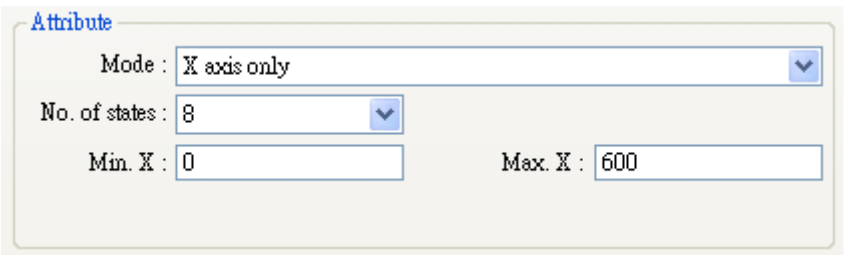


Attribute

To select the object's moving mode and range.

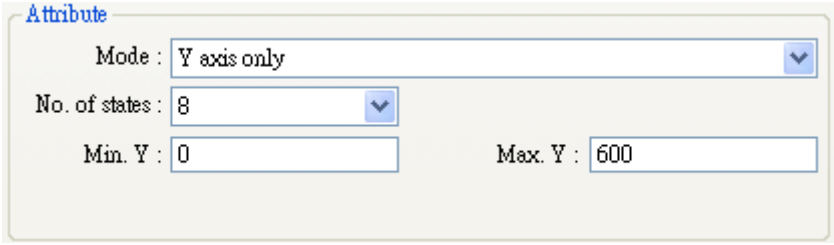
a. X axis only

The object is only allowed to move along the X-axis. The moving range is defined by [Min. X] and [Max. X].



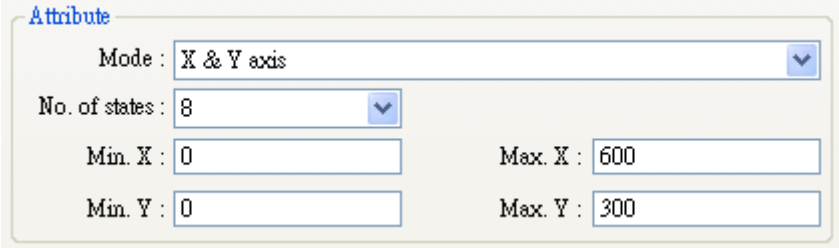
b. Y axis only

The object is only allowed to move along the Y-axis. The moving range is defined by [Min. Y] and [Max. Y].



c. X & Y axis

The object is allowed to move along the X-axis and Y-axis. The moving range is defined by [Min. X], [Max. X] and [Min. Y], [Max. Y]

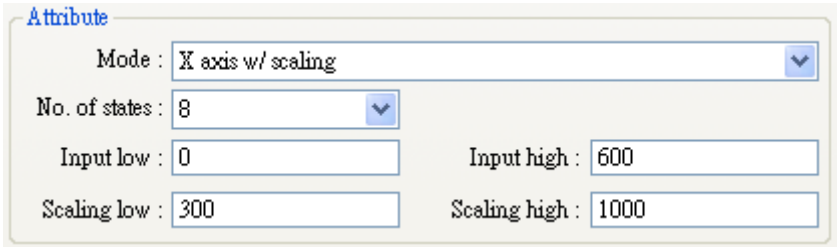


d. X axis w/ scaling

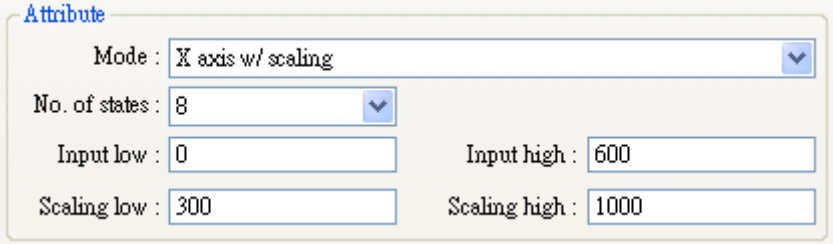
The object is only allowed to move by the designated scale along the horizontal X-axis. Supposed that the value of the designated register is DATA, and the following formula can calculate the moving distance on the X-axis.

X axis move distance =

(DATA – [Input low]) * ([Scaling high – Scaling low]) / ([Input high] – [input low])



For example, the object is only allowed to move within 0~600, but the range of the register's value is 300~1000, set [Input low] to 300 and [Input high] to 1000, and set [Scaling low] to 0 and [Scaling high] to 600, and the object will move in the designated range.



e. Y axis w/ scaling

The object is only allowed to move by the designated scale along the vertical Y-axis., and the formula to calculate the moving distance on the Y-axis is the same as the one in "X axis w/ scaling."

f. X axis w/ reverse scaling

This function is the same as "X axis w/ scaling", but the moving direction is reverse.

g. Y axis w/ scaling

This function is the same as "Y axis w/ scaling", but the moving direction is reverse.

Display ratio

The displaying size of object's shape in different states can be set individually as shown in the picture below.

Limit address

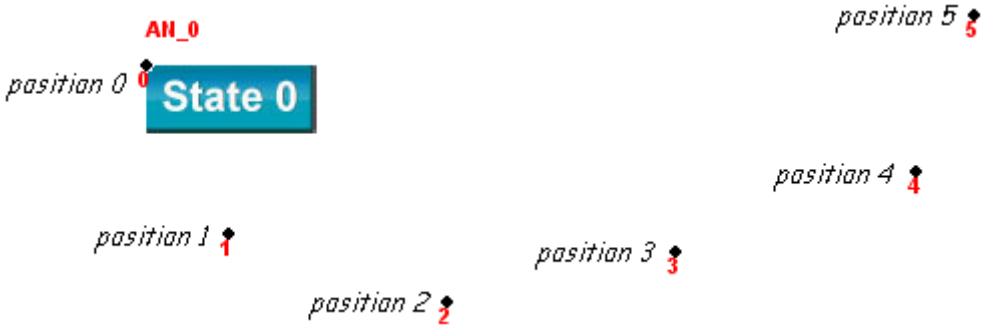
The object's displaying range can be set not only by [Min. X], [Max. X] and [Min. Y] [Max. Y], but also by the designated register. Supposed that the object's displaying range is set by the value of the designated register "Address", the reading address of [Min. X], [Max. X] and [Min. Y] [Max. Y] are listed in the following table.

Data format	[Min. X] read address	[Max. X] read address	[Min. Y] read address	[Max. Y] read address
16-bit BCD	Address	Address + 1	Address + 2	Address + 3
32-bit BCD	Address	Address + 2	Address + 4	Address + 6
16-bit Unsigned	Address	Address + 1	Address + 2	Address + 3
16-bit Signed	Address	Address + 1	Address + 2	Address + 3
32-bit Unsigned	Address	Address + 2	Address + 4	Address + 6
32-bit Signed	Address	Address + 2	Address + 4	Address + 6

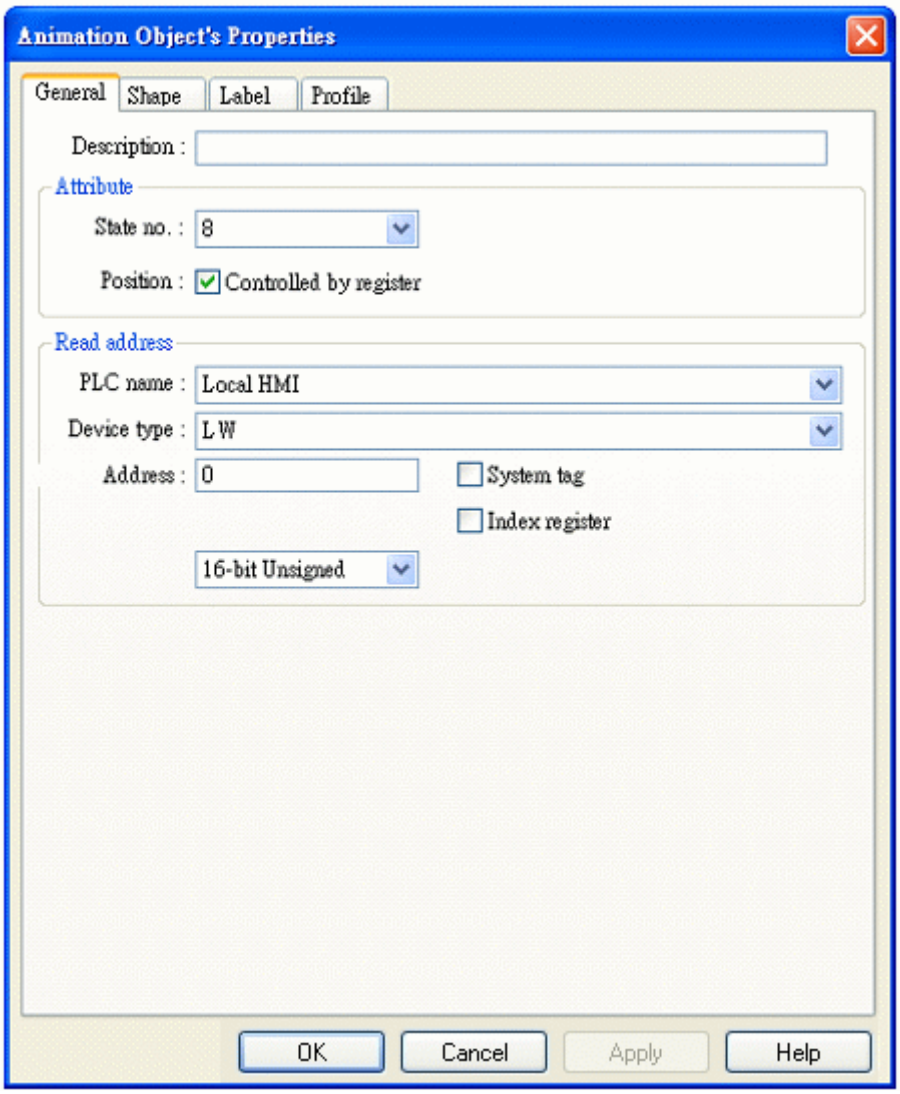
Animation Object

Users can define a moving path of the Animation Object in advance, and control the object's state and position on the moving path by changing the value of the designated register.

Click the "Animation" icon on the toolbar, and click the left button of the mouse at the proper position in the editing window to define a new moving position. When definitions of all moving positions are completed, click the right button of the mouse, and a new animation object and a moving path will be created. See the picture below.



When wanting to change the object's attributes, double click the left button of the mouse on the object, and the "Animation Object's Properties" dialogue box, as shown in the picture below, will appear for users to change the object's attributes.



Attribute

[State no.]

To set the number of the object's states.

[Position]

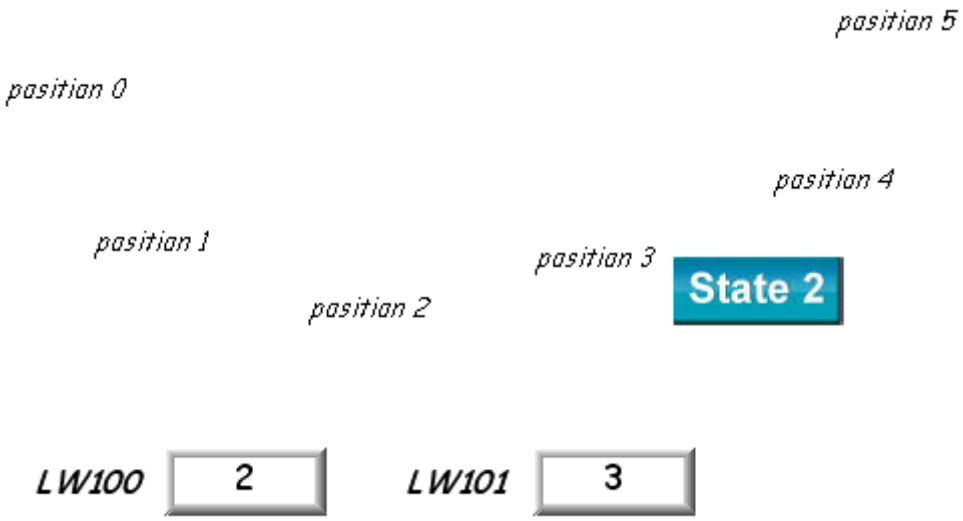
When select "Controlled by register", the designated register controls the object's state and position.

Read address

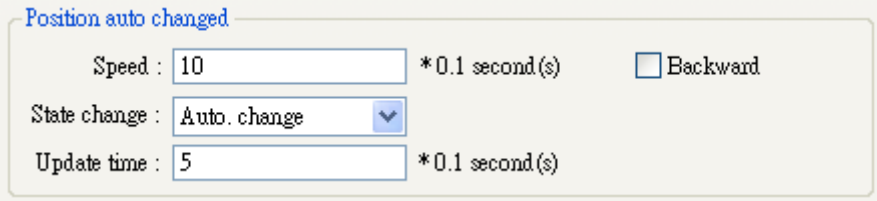
If the designated register controls the object's state and position, it is necessary to set the read address correctly. In the table below, Address represents the read address, when the register is [LW100], Address is 100.

Data Format	Read address of object's state	Read address of object's position
16-bit BCD	Address	Address + 1
32-bit BCD	Address	Address + 2
16-bit Unsigned	Address	Address + 1
16-bit Signed	Address	Address + 1
32-bit Unsigned	Address	Address + 2
32-bit Signed	Address	Address + 2

For example, if the designated register is [LW100] and the data format is "16-bit Unsigned", then [LW100] is to save the object's state, [LW101] is to save the object's displaying position. In the picture below, [LW100] = 2, [LW101] = 3, so the object's displaying state is 2 and displaying position is 3.



If “Controlled by register” is not selected, the object will change the state and displaying position automatically. “Position auto changed” is used to set the change mode of state and displaying position.



[Speed]

Position changes speed, the unit is 0.1 second. Supposed that [Speed] is set to 10, the object will change its position every 1 second.

[Backward]

Supposed that the object has four positions: position 0, position 1, position 2, and position 3. If [Backward] is not selected, when the object moves to the last position (position 3), next position will be back to the initial position 0, and

repeat the moving mode again and again. The moving path is shown as follows:

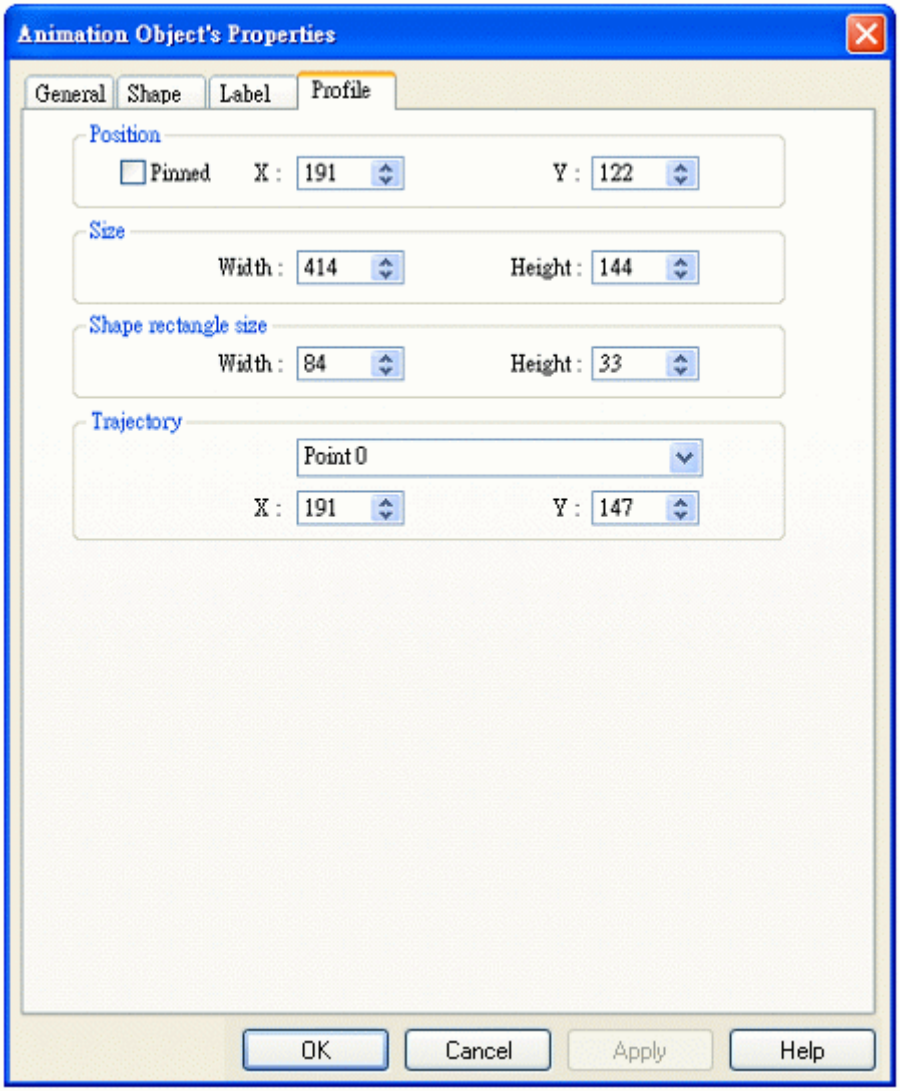
position 0-> position 1->position 2->position 3-> position 0-> position 1-> position 2…

If [Backward] is selected, when the object moves to the last position (position 3), it will move backwards to the initial position 0, and repeat the moving mode again and again. The moving path is shown as follows.

position 0-> position 1->position 2->position 3-> position 2-> position 1-> position 0…

[State changed]

State's changing mode. There are "Position dependant" and "Auto changed" for selection. When "Position dependant" is selected, it means that following the change of position, the state will change too. When "Auto change" is selected, it means that the position will change automatically in a fixed frequency, and the changing frequency can be set in [Update time].



Shape rectangle size

To set the size of object's displaying shape.

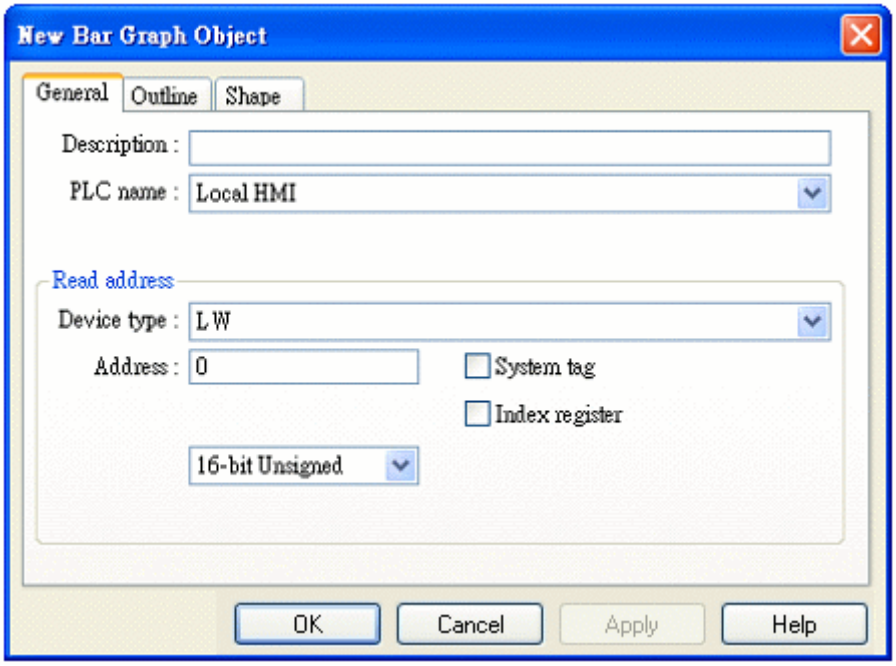
Trajectory

To set the position of each point on the moving path.

Bar Graph Object

Bar graph object displays PLC register data as a bar graph in proportion to its value. Click the “Bar Graph” icon on the toolbar, there will appear “Bar Graph” dialogue box, press OK button after correctly fill in the General Attribute, there will be a new “Bar Graph Object”. See the picture below.

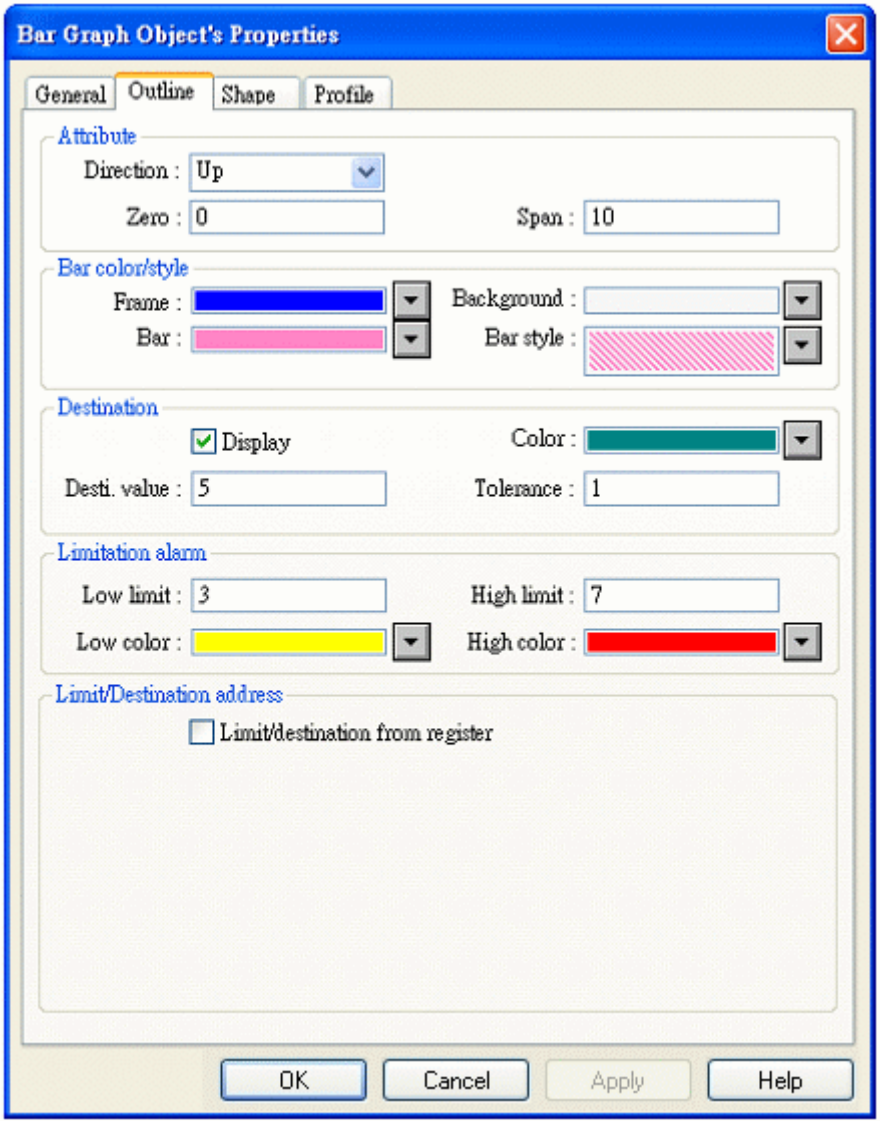
The following picture shows the “General” tab of the bar graph object.



Read address

PLC’s register address that controls the bar graph display.

The following picture shows the “Outline” tab of the bar graph object.



Attribute

[Direction]

To select the bar’s displaying direction, and there are ”Up”, “Down”, “Right”, and “Left” for selection.

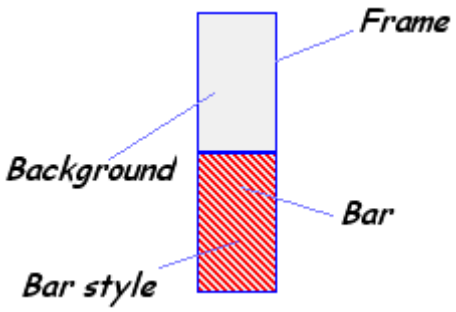
[Zero]、[Span]

The filled bar percentage can be calculated with the following formula:

The filled bar percentage = (Register value – Zero)/ [Span] – [Zero]) *100%

Bar color/style

To set the bar's Frame, Background color, Bar style, and Bar color. See the picture below.

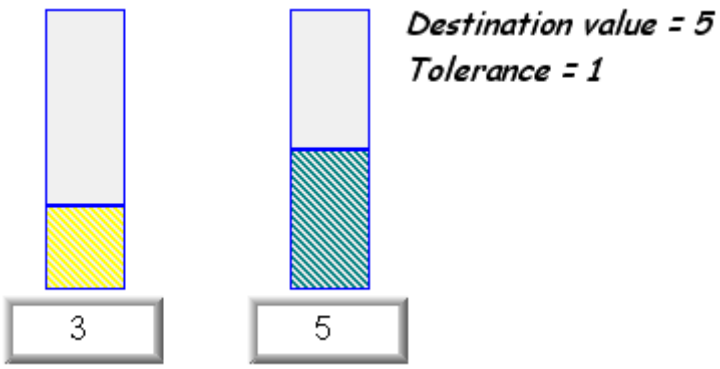


Destination

When the register value meets the following condition, the filled area's color of the bar will change to the "Destination color"

[Desti. Value] - [Tolerance] < = Register value < = [Desti. Value] + [Tolerance]

See the picture below, in here [Desti. Value] = 5, [Tolerance] = 1, if the register value is equal to or larger than 5-1=4 and equal to or less than 5+1=6, the filled area's color of the bar will change to the "Destination color"

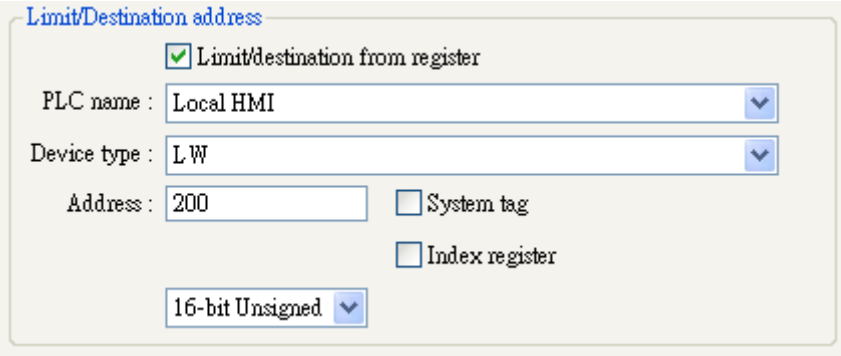


Limitation alarm

When register's value is larger than [High limit], the filled area's color of the bar will change to [High color], when register's value is smaller than [Low limit], the filled area's color of the bar will change to [Low color].

Limit/Destination address

When select [Limit/destination from register], the [Low limit] and [High limit] of "Limitation alarm" and the [Desti. Value] of "Destination" all come from designated register. See the picture below.

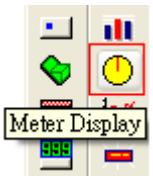


The following table shows the read address of low limit, high limit, and destination. The “Address” means the register’s address, for example, if the register is [LW100], the “Address” is 100.

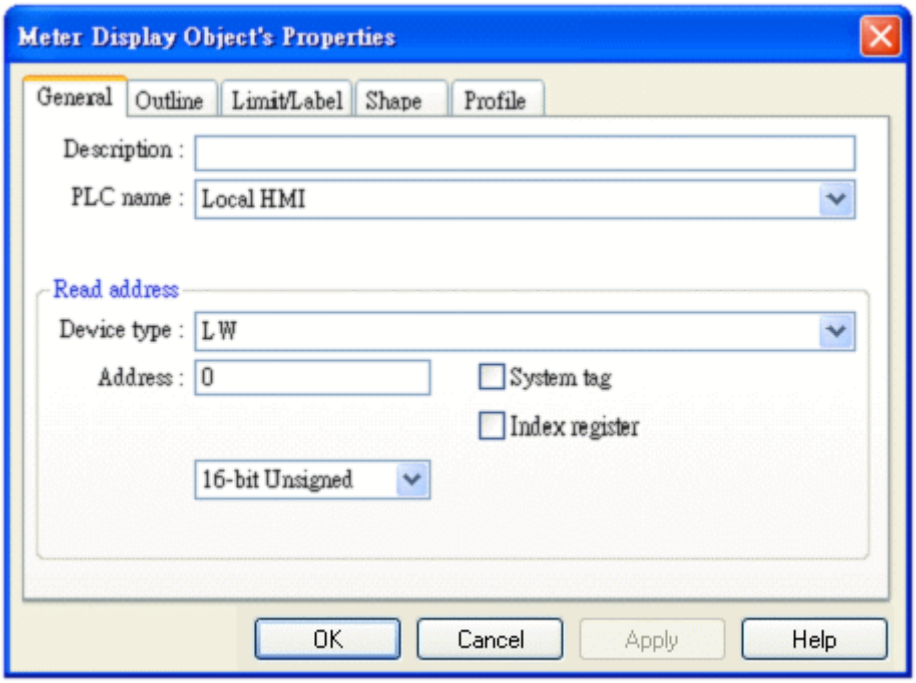
Data Format	Low limit	High limit	Destination
16-bit BCD	Address	Address + 1	Address + 2
32-bit BCD	Address	Address + 2	Address + 4
16-bit Unsigned	Address	Address + 1	Address + 2
16-bit Signed	Address	Address + 1	Address + 2
32-bit Unsigned	Address	Address + 2	Address + 4
32-bit Signed	Address	Address + 2	Address + 4

Meter Display Object

The meter display object can displays the PLC register's data by using meter in proportion. Click the "Meter Display" icon on the toolbar and the "Meter Display Object's Properties" dialogue box will appear, then press the OK button after correctly setting each item in the "General" tab, and a new "Meter Display Object" will be created. See the picture below.

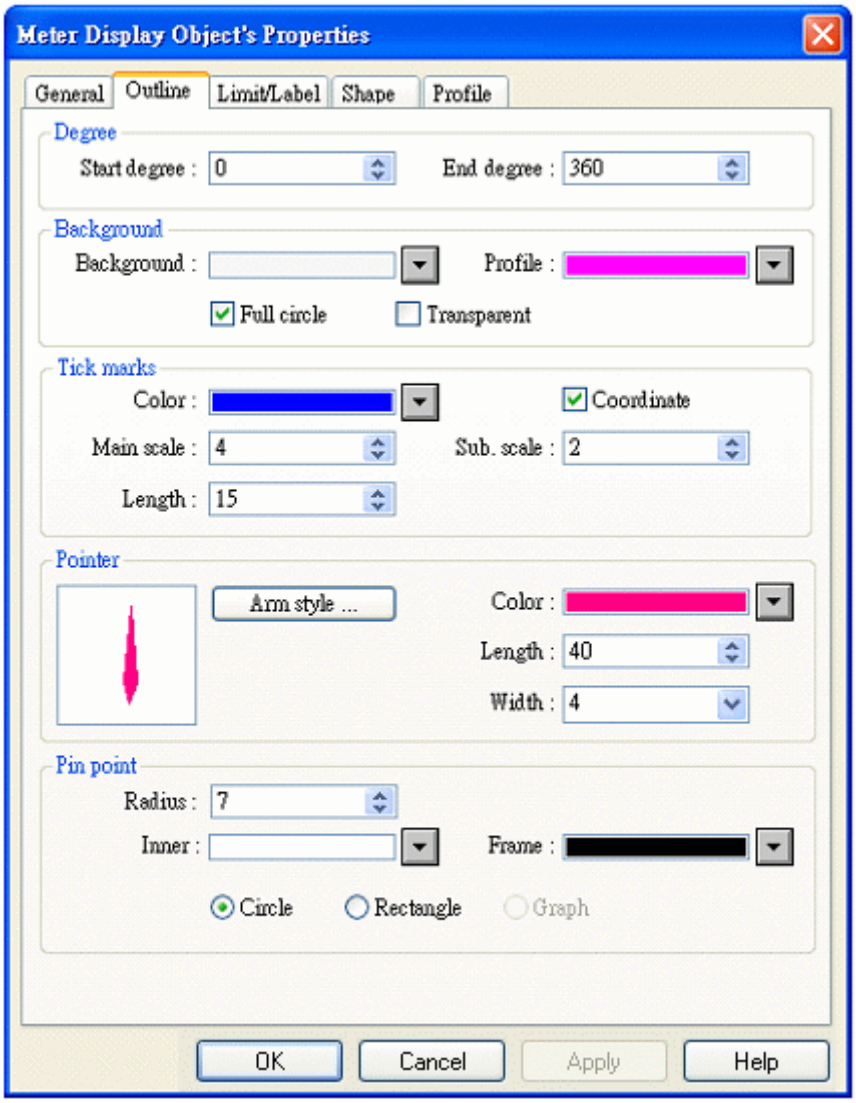


The picture below shows the "General" tab in the "Meter Display Object's Properties" dialogue box.



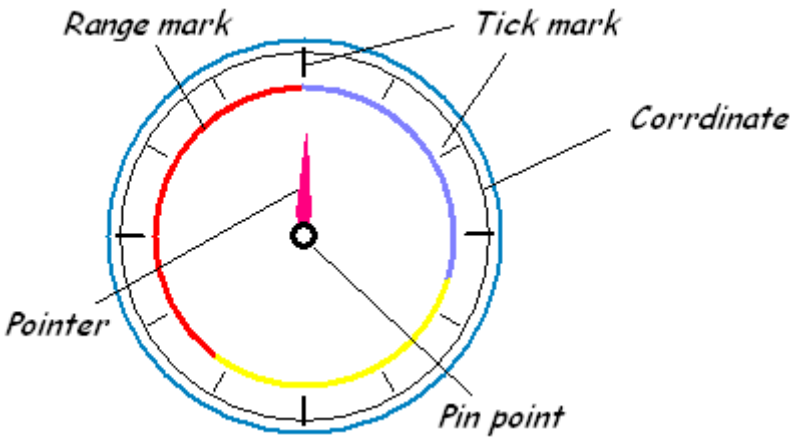
Read address

PLC's register address that control the displayed value.



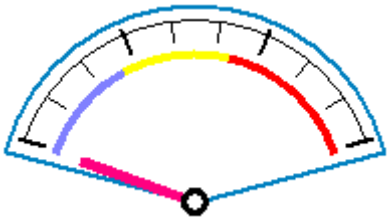
In the above dialogue box, users can set the meter display object's outline.

Refer to the picture below for the names of each part of the meter.

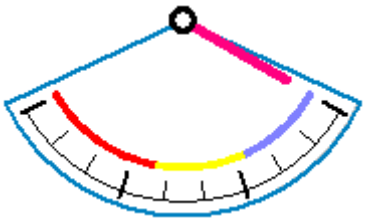


Degree

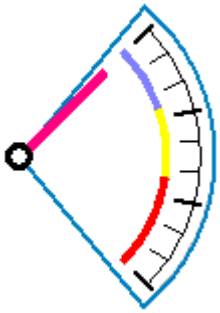
Set the object's "start degree" and "end degree", the angle range is 0-360 degrees. The following pictures show several results of different settings.



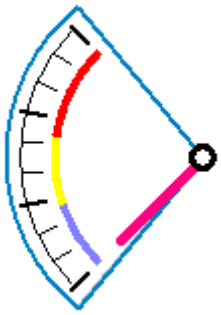
[Start degree] = 290, [End degree] = 70



[Start degree] = 45, [End degree] = 240



[Start degree] = 120, [End degree] = 135



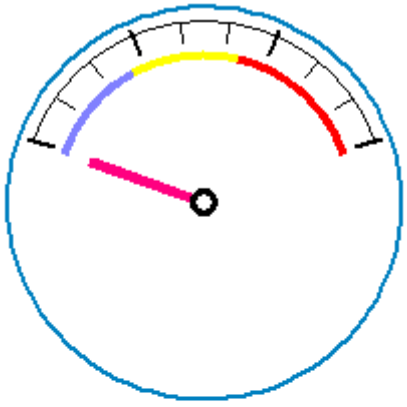
[Start degree] = 225, [End degree] = 315

Background

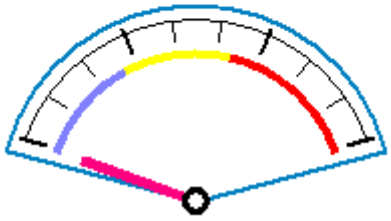
Set the object's background color and profile color.

[Full circle]

When the "Full circle" is selected, the object will display the whole circle, otherwise the object will display the defined degree range. See the picture below.



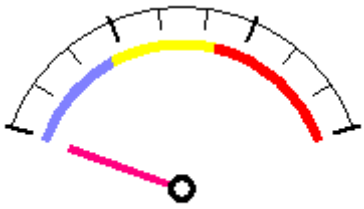
Full circle



non-full circle

[Transparent]

When the “Transparent” is selected, the object will not display the background and profile color. See the picture below.



Transparent

Tick marks

To set the tick mark’s number and color.

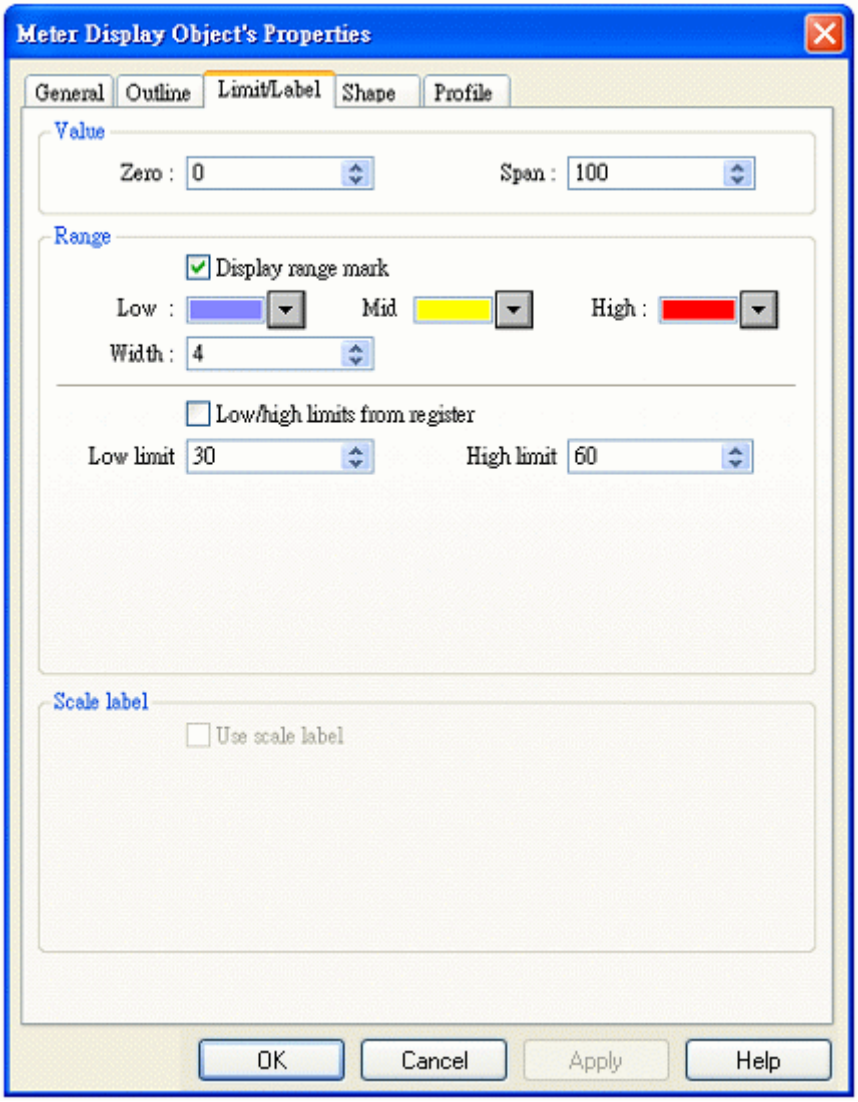
Pointer

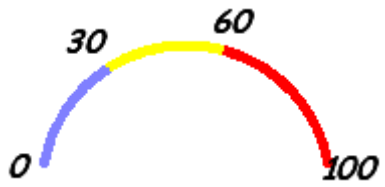
To set Pointer's style, length, width, and color.

Pin point

To set pin point's style, radius, and color

The following pictures show the "Limit" tab and the sign of low and high limit set in the "Limit" tab.





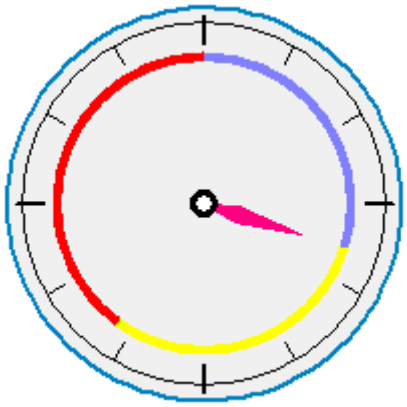
Value

To set object's displaying range. Meter display object will use the value of [Zero] and [Span] and the value of register to calculate the pointer's indication position. For example, supposed that [Zero] = 0, [Span] = 100, when the value of register is 30 and [Start degree] = 0, [End degree] = 360, then the degree indicated by pointer is:

{(30 – [Zero])/([Span] – [Zero])} * ([[End degree] - [Start degree]] =

{(30 – 0) / (100 - 0)} * (360 – 0) = 108

Pointer will indicate the position of 108 degrees. See the picture below.



Range

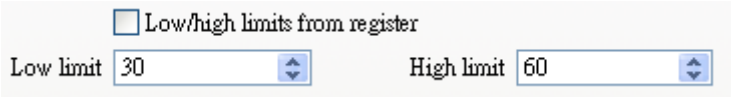
To set the value of low and high limit and the displaying color and width of the sign of low and high limit.

[Display range mark]

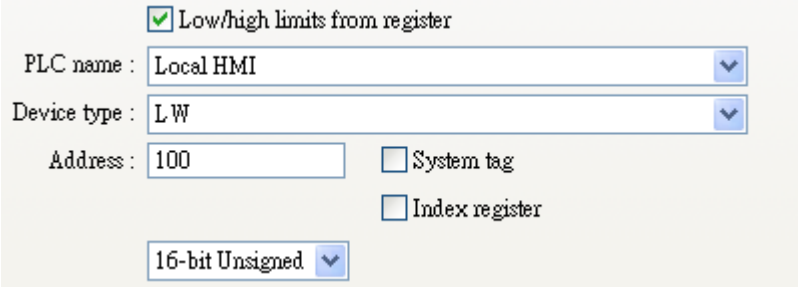
Whether or not to display the range mark.

[Low/ high limits from register]

When “Low/ high limits from register” is not selected, the low limit and high limit are a fixed value, which directly comes from settings. See the example in the picture below, the low limit is 30 and high limit is 60.



If “Low/ high limits from register” is selected, the register value controls the low limit and high limit. See the picture below.

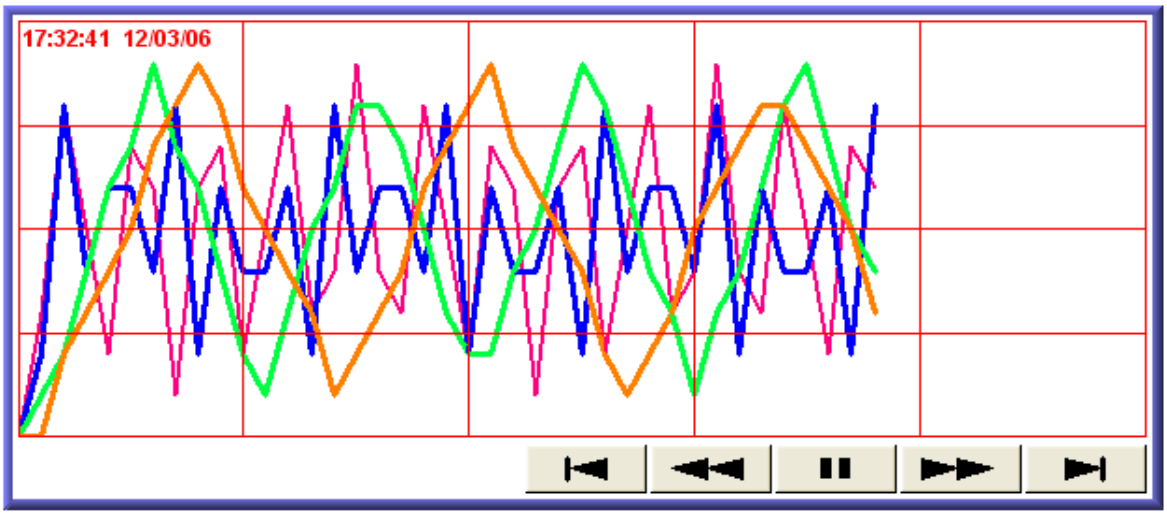


There following table shows the read address of low limit, high limit. The “Address” means the register’s address. If the register is [LW100], the “Address” is 100.

Data format	High limit’s read address	Low limit’s read address
16-bit BCD	Address	Address + 1
32-bit BCD	Address	Address + 2
16-bit Unsigned	Address	Address + 1
16-bit Signed	Address	Address + 1
32-bit Unsigned	Address	Address + 2
32-bit Signed	Address	Address + 2

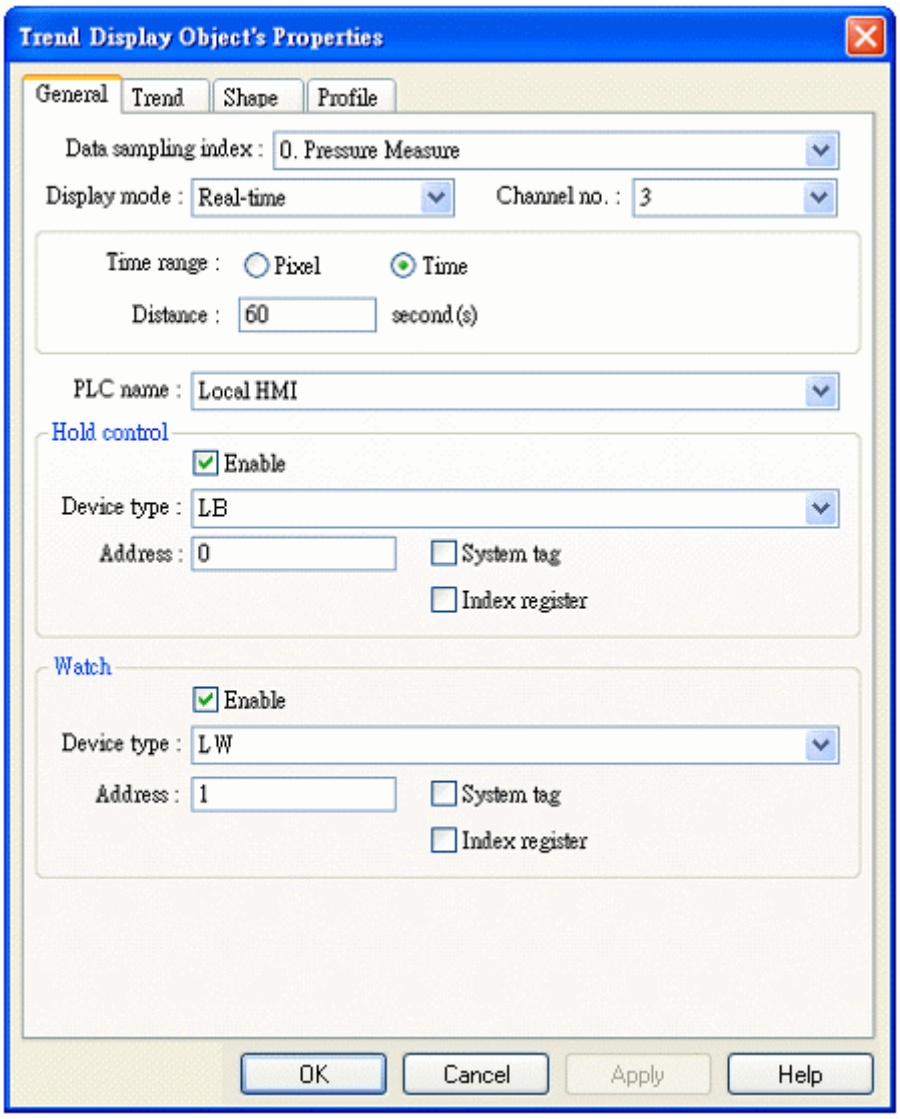
Trend Display Object

Trend display object can use the continuous line to describe the data recorded by data sampling object, so the trend of data changing's variation can be showed clearly. The following picture shows the status of using trend display object.



Click the "Trend Display" icon on the toolbar and the "Trend Display Object's Properties" dialogue box will appear, then press the OK button after correctly setting each item in the "General" tab, and a new "Trend Display Object" will be created. See the picture below.

The following picture shows the “General” tab in the “Trend Display Object’s Properties” dialogue box.



[Data sampling index]

To select data sampling object as the data source required for graphing. Refer to the “data sampling” section for related information.

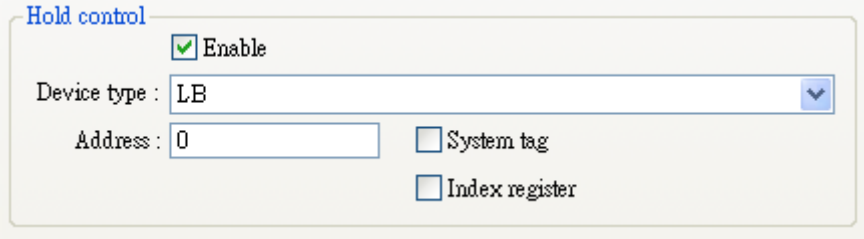
[Display mode]

To select the format of data source and there are “Real-time” and “History” for selection.

a. **Real-time**

In the mode, it can display the sampling data from the beginning of the MT8000 operation to the present time. If previous data are required, users must select the “History” mode to read the data from historical record.

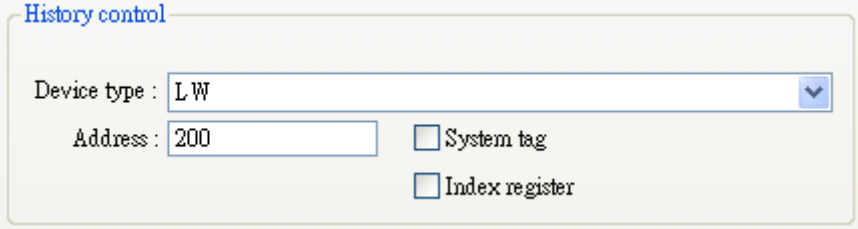
Users can use the “Hold control” object to pause updating the trend display, but it is only limited to pausing the updating of the trend display, and it will never stop the object sampling the data. The picture below shows the “Hold control” setting page. Set the state of the designated register to ON, it will pause updating the trend display.



b. **History**

In the mode, the displayed sampling data come from the historical record of the designated data sampling object in [Data sampling index]. Data sampling object will use the sampling data that are stored by sorting according to dates. It is able to use “History control” to select

the historical records that are created by the same data sampling object. The picture below shows the “History control” setting page.



The EB8000 will sort the historical records of sampling data by date; the latest file is record 0 (normally it is today’s saved sampling data), the second latest file is record 1, and the rest may be deducted in the same way.

If the value of designated register in “History control” is 0, the trend display object will display data of record 0; if the value of designated register in “History control” is 1, the trend display object will display the data of record 1; therefore, we can deduce that if the register’s value is n, the trend display object will display the data of record n.

Here is an example to explain how to use the “History control.” In the above picture, the designated register is [LW200], if the sampling data are saved by the current data sampling object in the order of date as the files of pressure_20061120.dtl, pressure_20061123.dtl, pressure_20061127.dtl, and pressure_20061203.dtl, and today’s date is 2006/12/3, according to the value of [LW200], the sampling data files

displayed by the trend display object are arranged in the following table.

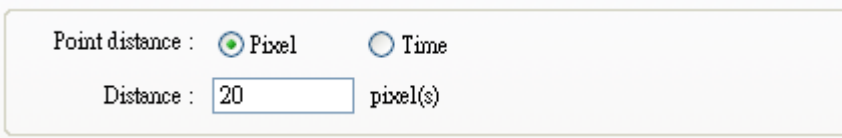
Value of [LW200]	The files of the sampling data from the historical record
0	pressure_20061203.dtl
1	pressure_20061127.dtl
2	pressure_20061123.dtl
3	pressure_20061120.dtl

In other words, the smaller the value of [LW200] is, the closer to the present time the historical record will be.

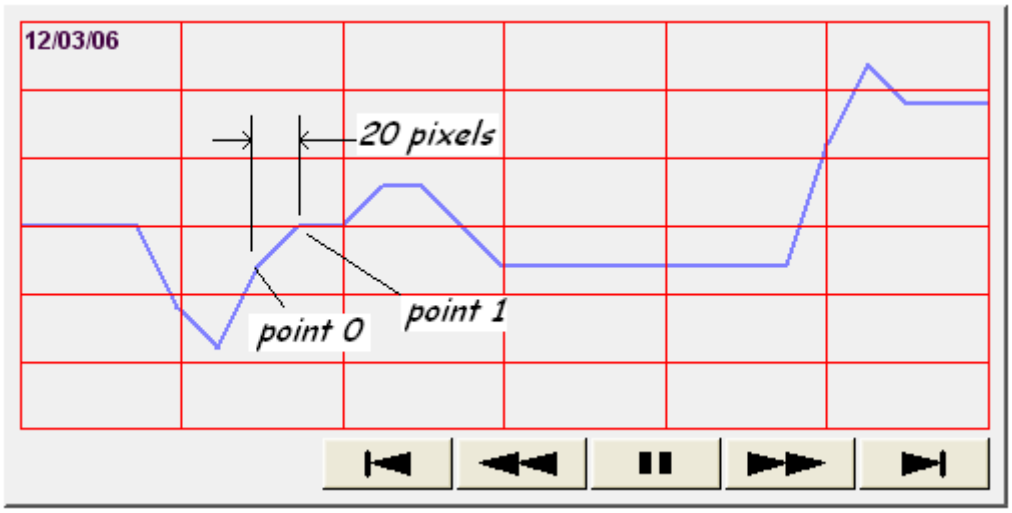
[Channel no.]

The channel number that the object can display. Each channel means the data sampling object continue to get the sampling data for one PLC register.

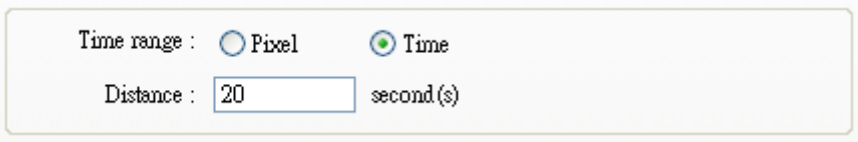
[Pixel]



Select [Pixel], the [Distance] can be used to set the distance between two sampling points. See the picture below.

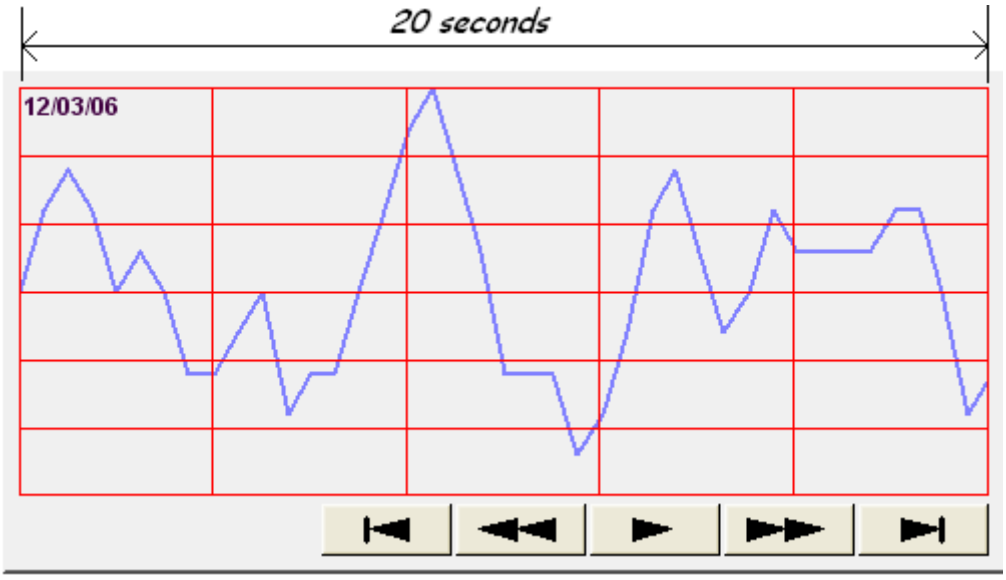


[Time]

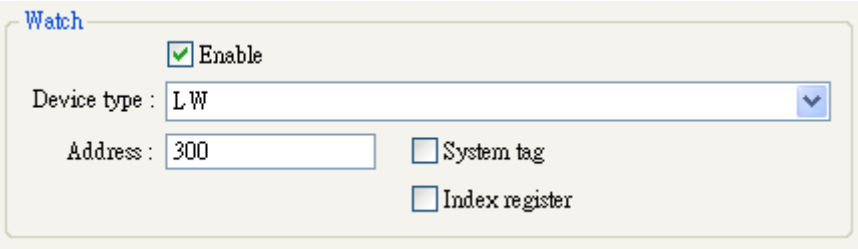


Select [Time], the [Distance] is used to set the time range for the display shape.

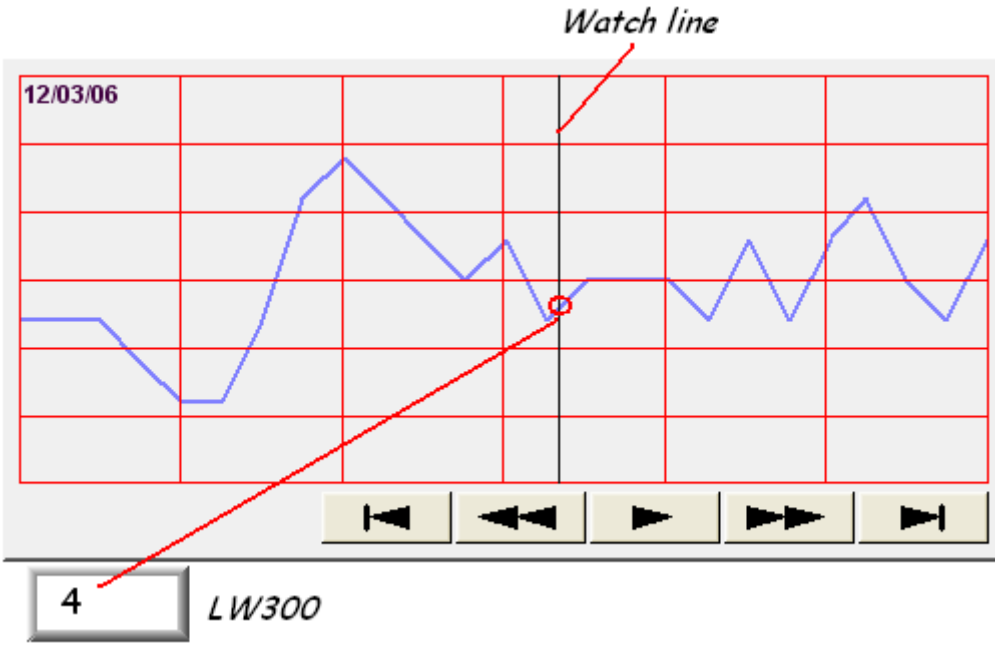
See the picture below.



Watch



Using the “Watch” function, when user touch the trend display object, object will display a “watch line”, and can export the sampling data at the position of watch line to the designated register. See the picture below, export the sampling data at the position of watch line to [LW300]



“Watch” function also can export several channel sampling data, MT8000 export the sampling data at the position of watch line to the designated register in turn according to the data format defined by data sampling object. For example each sampling data include four data format, they are “16-bit unsigned”, “32-bit unsigned”, “32-bit float”, and “16-bit Signed” respectively.

Suppose now the [LW300] is the designated register defined by “Watch”, the following are the export address of sampling data marked by “watch line”.

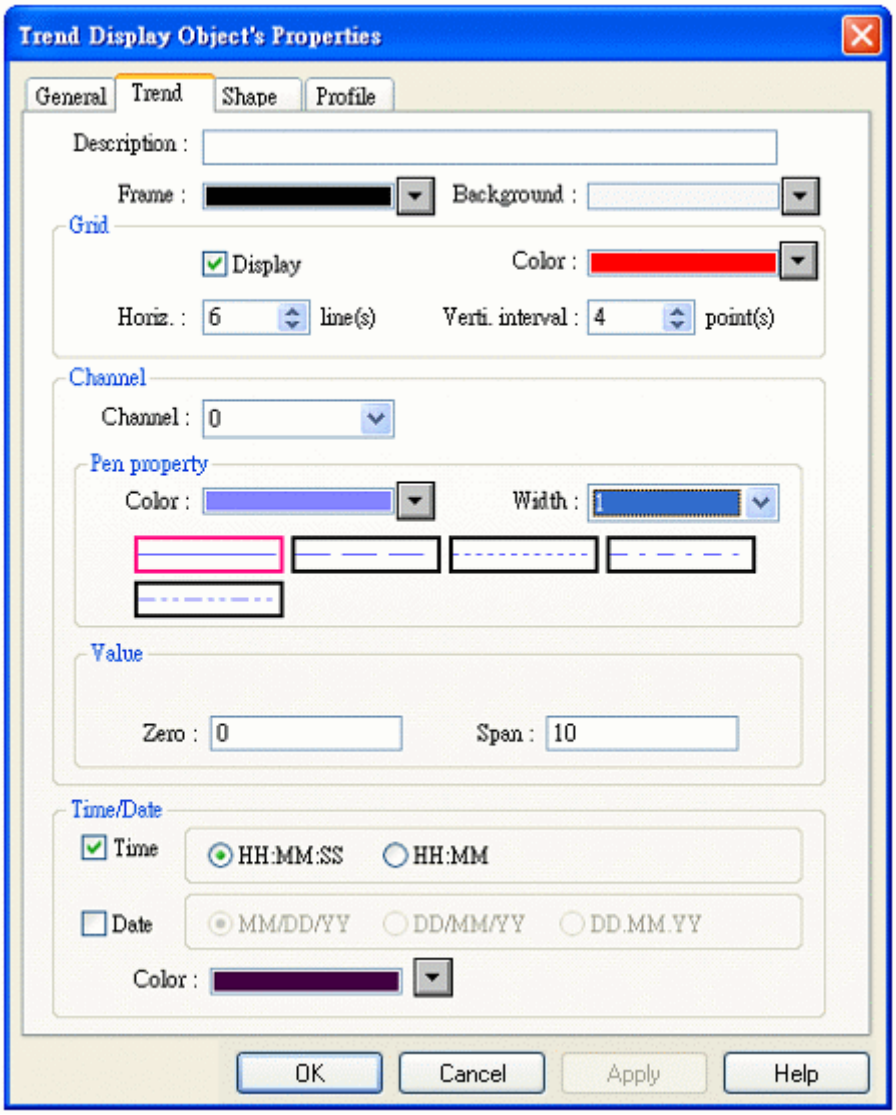
[LW300] Line 0 : 16-bit Unsigned (1 words)

[LW301] Line 1 : 32-bit Unsigned (2 words)

[LW303] Line 2 : 32-bit Unsigned (2 words)

[LW305] Line 3 : 16-bit Signed (1 words)

The picture below shows the “trend display” setting page.



[Frame]

Object frame's color.

[Background]

Object background's color.

Grid

Set the number grid and grid color.

[Display]

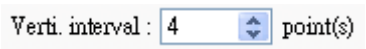
Select whether use grid line.

[Horiz.]

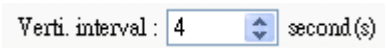
Set the number of horizontal line.

[Verti. interval]

When select [pixel] to set the display interval (see note on the above graph and "General" tab), the [Verti. interval] is used to select how many sampling point will be included between two vertical grid line. See the picture below.



When select [Time] to set the time range of display data, the [Verti. interval] is used to select the time range between two vertical grid lines. See the picture below.



According to these settings, MT8000 will calculate the number of vertical grid line automatically.

Channel

Set each sampling line's format and color, and the display data's low limit and high limit.

[Zero]、[Span]

[Zero] and [Span] are used to set the low limit and high limit of sampling data, So if the low limit is 50 and high limit is 100 for one sampling line, then [Zero] and [Span] must be set as [50] and [100], so all the sampling data can be totally displayed in the trend display object.

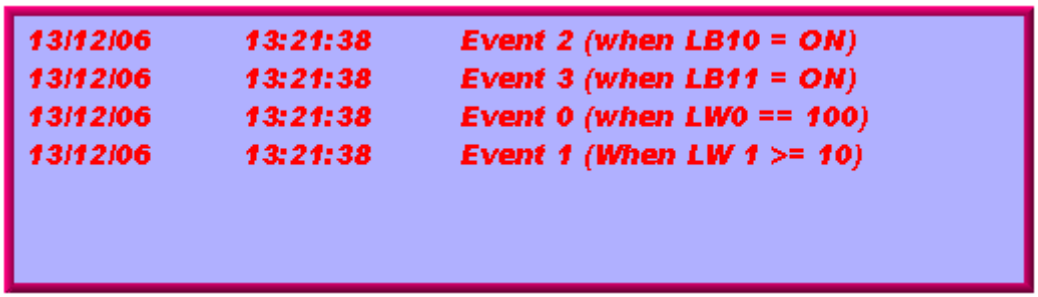
Time/Data

The time of latest sampling data will be marked on the top left corner of the object. It is used to set the time display format and color.

Alarm Bar and Alarm Display Objects

Alarm bar and alarm display object are used to display messages registered in the “event log” when the system current state meets trigger conditions. Here these messages are also called alarm. Alarm bar and alarm display object display these alarms in order of triggering time, of which alarm bar object will display all alarm messages in one line, alarm display object use multi-line to display alarm messages and each line display one alarm content. The following pictures show that the same alarm message is displayed in different object. Refer to the “Event Log” chapter for related information.

alarm bar object

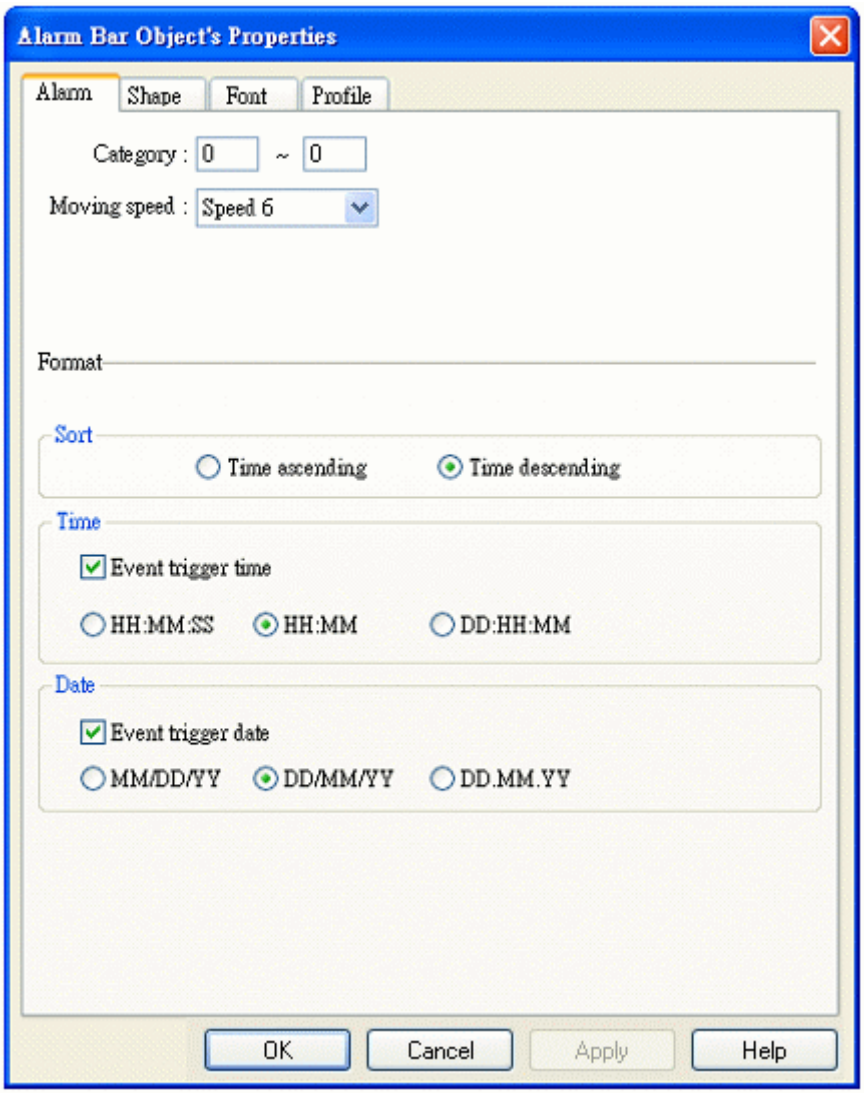


alarm display object

Click the “Alarm bar” icon on the toolbar, there will appear the “Alarm bar” dialogue box; in the same way, click the “Alarm display” icon on the toolbar, there will appear the “Alarm display” dialogue box. Press the OK button after correctly setting in the “General” tab, a new object will be created. See the pictures below.

Alarm Bar

Alarm Display


Alarm Bar Object's Properties
Alarm
Shape
Font
Profile
Category : 0 ~ 0
Moving speed : Speed 6
Format
Sort
Time ascending
Time descending
Time
Event trigger time
HH:MM:SS
HH:MM
DD:HH:MM
Date
Event trigger date
MM/DD/YY
DD/MM/YY
DD.MM.YY
OK
Cancel
Apply
Help

[Category]

Alarm's "category" can be displayed when it meet its defined range.("Category" can be set in "event log"). For example, when the "Category" of alarm bar object is set as 2~4, then it will be displayed until "Category" equal 2 or 3 or 4's alarm. Refer to the "Category" section in "Event Log" chapter for related information.

[Moving speed]

The display text's moving speed in alarm bar object.

Sort

Set the alarm display order.

[Time ascending]

Later triggering alarm is arranged the back (or down).

[Time descending]

Later triggering alarm is arranged the front (or up).

Time

[Event trigger time]

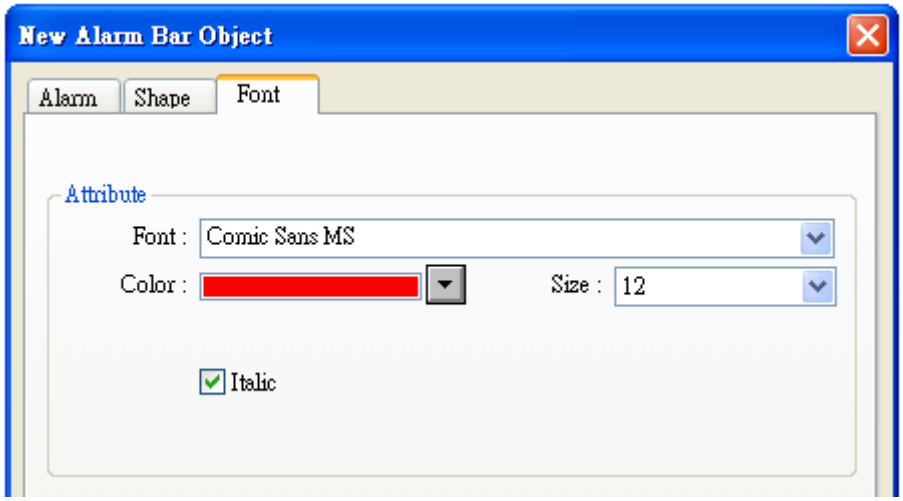
Select whether or not to display the trigger time.

Date

[Event trigger date]

Select whether or not to display the trigger date.

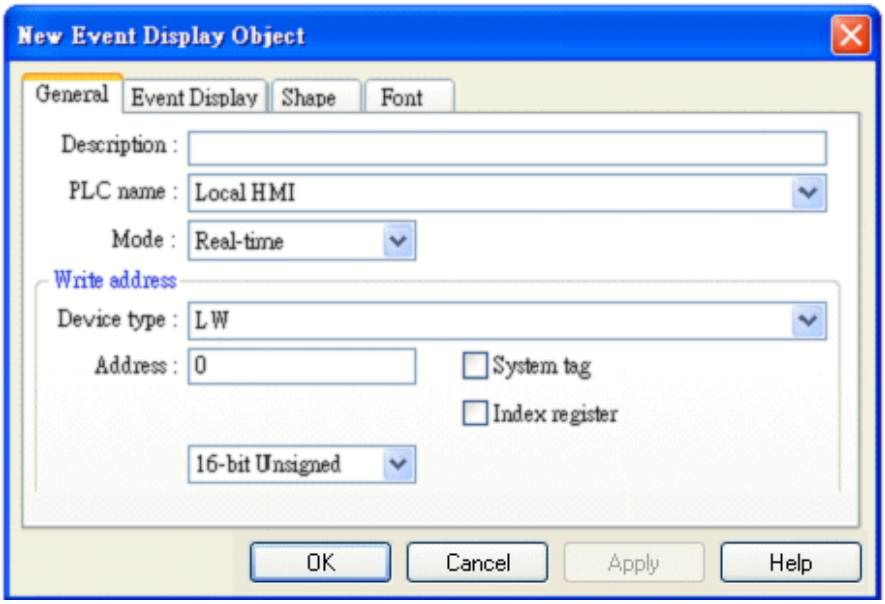
Set object's font and color in the "Font" tab. See the picture below.



Event Display Object

Event display object can be used to display messages registered in the "event log" when the system current state meets trigger conditions. Event display object display these event messages in order of triggering time. See the picture below, event display object also allow the display of event trigger, acknowledge and return to normal times (System state does not meet the triggering conditions any longer.)

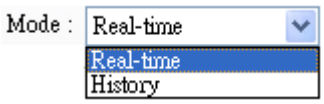
Click the “Event Display” icon on the toolbar, there will appear the “Event Display” dialogue box, press the OK button after correctly setting each item in the “General” tab, and a new “Event Display Object” will be created. See the picture below.



[Mode]

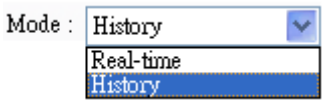
Select the event source format, there are “Real-time” and “History” for selection.

a. Real-time

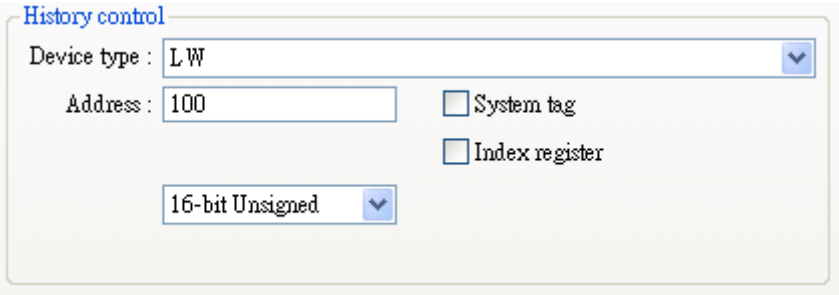


In the mode, it can display the data from the beginning of the MT8000 operation to the present time. If previous data are needed, users must select “History” mode to read the data from historical record.

b. History



In the mode, the event display object will display the events stored in the historical record. The EB8000 will save the event history record and sort it by date. Users can set the “History control” item to select display record. The picture below shows the “History control” setting page.



The EB8000 can arrange the history records in order of time, the latest file record is 0 (normally it is today’s saved record), the second latest file record is 1. The rest may be deduced in the same way.

If the value of designated register in “History control” is 0, event display object will display the value of record 0; if the value of designated register in “History control” is 1, event display object will display the value of record 1, so if the register value is n, it will display the value of record n.

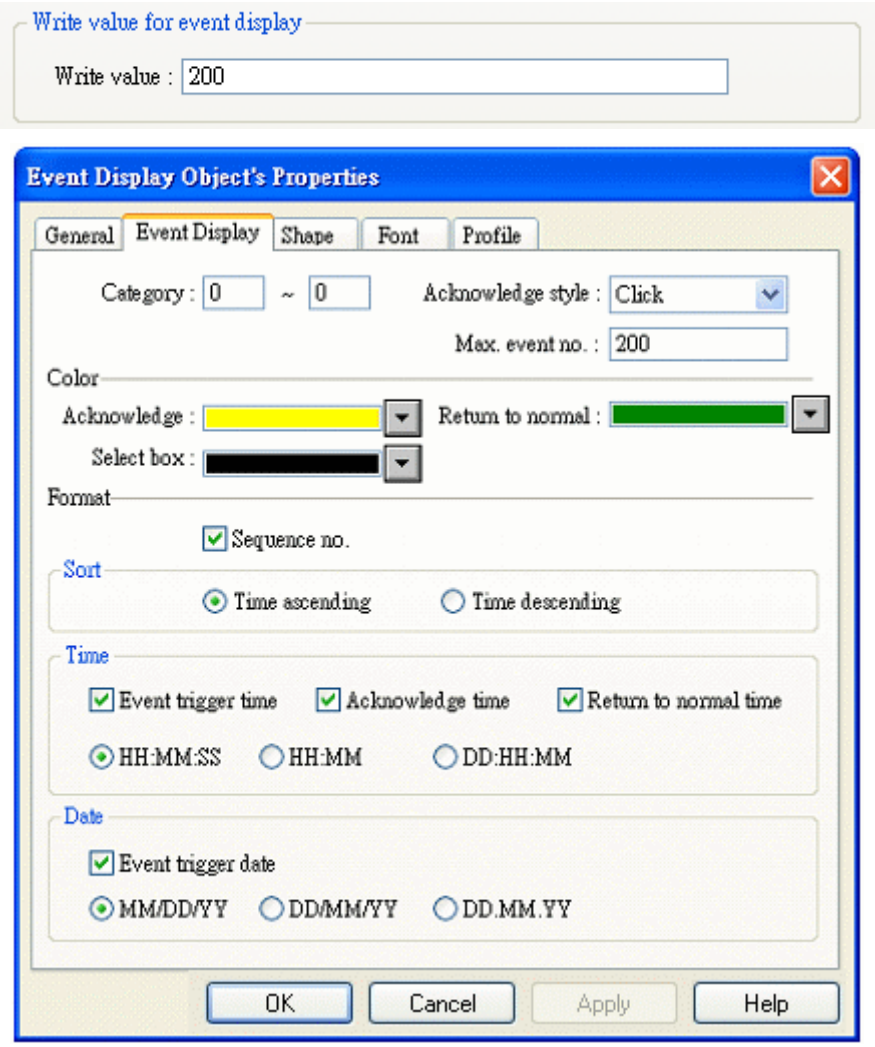
Here is an example to explain how to use the “History control”. The designated register in the above picture is [LW100], supposed that the current historical record are saved in the order of date to the files as pressure_20061120.dtl, pressure_20061123.dtl, pressure_20061127.dtl, and pressure_20061203.dtl, and today’s date is 2006/12/3, then the following table shows the event display object displays the historical record according to the value of [LW100].

Value of [LW100]	Displayed Event’s Historical Record Files
0	EL_20061203.evt
1	EL_20061127. evt
2	EL_20061123. evt
3	EL_20061120. evt

In other words, the smaller the value of [LW100] is, the closer to the present time the historical record will be.

Write address

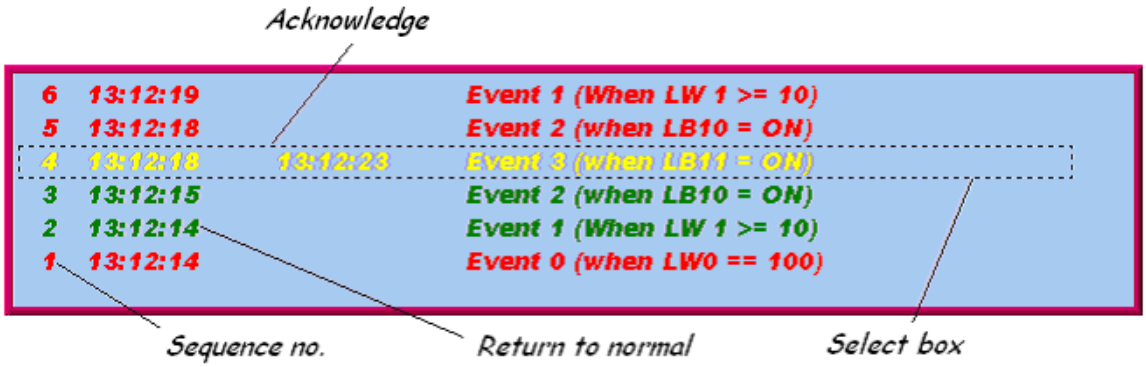
When the event is confirmed (refer to the following illustrations for detailed information), the data in “write value” will be exported to the designated register. The “write value” is set in “event log” item, as shown in the picture below. Refer to the “Event Log” chapter for related information.



[Category]

Event’s “category” can be displayed when it meet its defined range (“Category” can be set in “Event log”). For example, when the “Category” of event display object is set as 2~4, then it will be displayed until “Category” equal to 2 or 3 or 4’s event. Refer to information related to “Category” in the “Event Log” chapter.

[Acknowledge style]



Select the “confirm” action, there are “Click” or “Double click” to select. Here “confirm” action means that the event which has happened and displayed on the event display object can be “Clicked” or “Double clicked” by user, after the “confirm” action, the EB8000 will not only change the event’s color to the color in ”Notification”, but also export the value of “write address” to the designated register.

[Max. event no.]

The maximum of displaying event. When the number of displaying events is larger than maximum, new event will replace the event with lower security level.

Color

To set the color when the event is in the different states.

[Acknowledge]

To set the color after the event is confirmed.

[Return to normal]

To set the event's displaying color when system state can not meet the trigger conditions.

[Select box]

When event is selected, set the highlight box color.

[Sequence no.]

Select whether or not to add the sequence no. before the display event. A prior event uses a smaller sequence number.

Sort

Set the display order.

[Time ascending]

Later triggering event is arranged the back (or down).

[Time descending]

Later triggering event is arranged the front (or up).

Time

[Event trigger time]

Select whether display the trigger time.

[Acknowledge time]

Select whether display the “confirm” time.

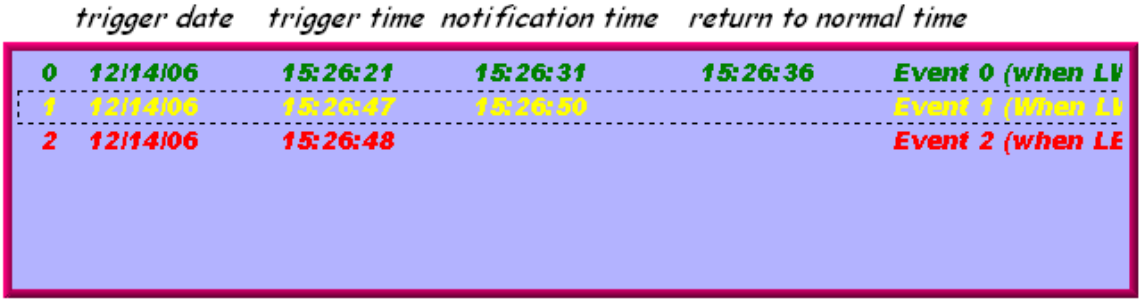
[Return to normal time]

Select whether display the display event returns to normal time.

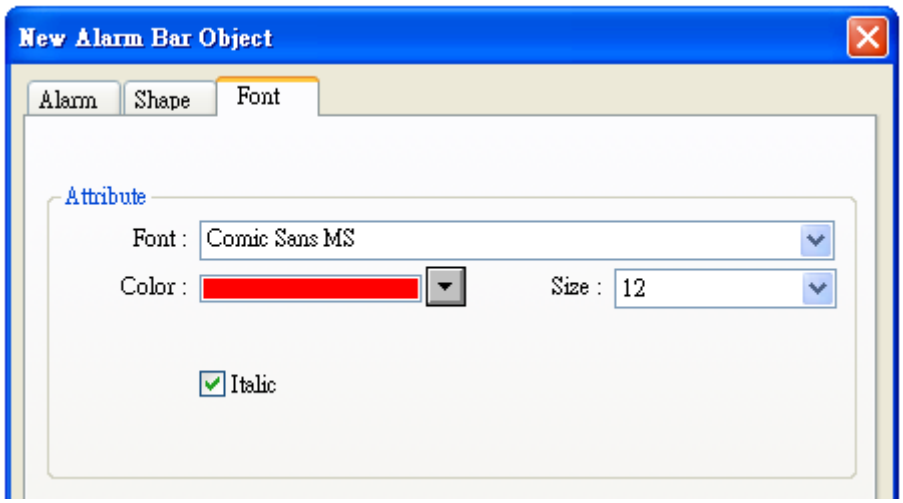
Date

[Event trigger date]

Select whether or not to display the trigger date.

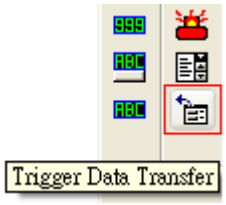


If the event just happens, the font and color of display text can be set in the “Font” tab. See the picture below.

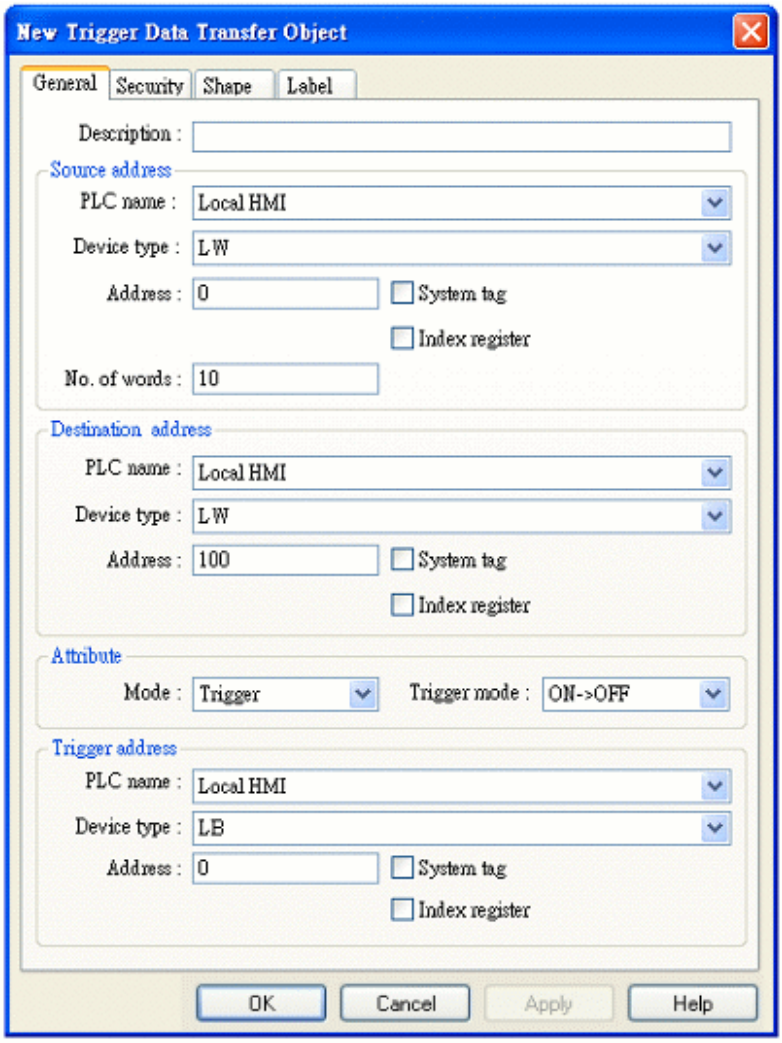


Trigger Data Transfer Object

Trigger data transfer object can transfer the value of designated register to other designated register, user can use the manual button can do the action, and using the trigger of designated register's state also can do the action.



Click "Trigger Data Transfer object" icon on the toolbar, there will appear "Trigger Data Transfer object" dialogue box, then press the OK button after correctly setting each item in the "General" tab, a new Trigger Data Transfer object will be created. See the picture below.



Source address

Source address for data transfer.

[No. of words]

The number of transfer data and the unit is word.

Destination address

Destination address for data transfer.

Attribute

Set the data transfer mode.

[Mode]

There are “Manual” mode and “Trigger” modes for selection.

a. **Manual mode**

   The object must be pressed manually to perform data transferring action.

b. **Trigger mode**

   Using the change of the state of designated register to trigger the data transferring action. Select the proper trigger mode in [Trigger mode], the trigger mode include:

   [ON->OFF]

When the register's state switch from ON to OFF, will trigger data transfer action.

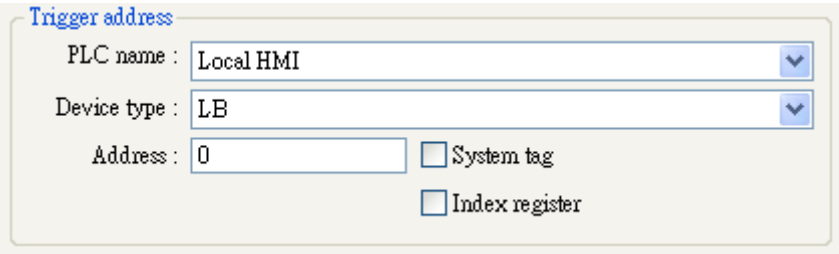
[OFF->ON]

When the register's state switch from OFF to ON, will trigger data transfer action.

[ON<->OFF]

When the register's state changes, will trigger data transfer action.

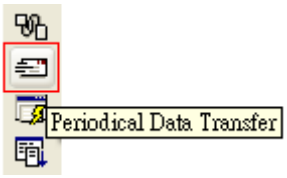
The designated register for the trigger mode can be set in [Trigger address] as shown in the picture below.

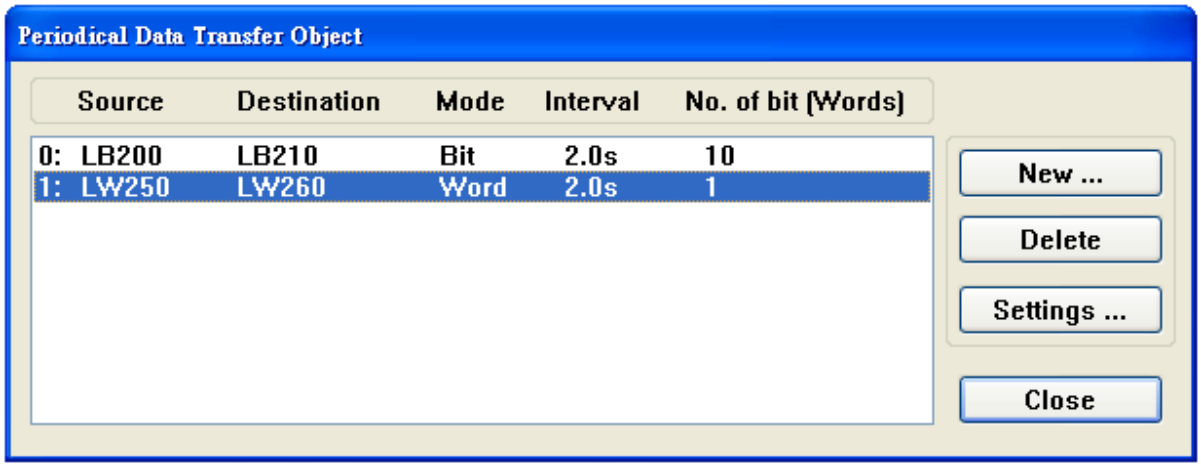


20. Periodical Data Transfer Object

Periodical data transfer object is the same as trigger data transfer object, transfer the value of designated register to other designated register. The difference from trigger data transfer object is, periodical data transfer object perform data transfer action automatically at a fixed frequency, and can transfer the data as the unit of bit.

Click “Periodical Data Transfer object” icon on the toolbar, there will appear the “Periodical Data Transfer object” dialogue box. See the pictures below.

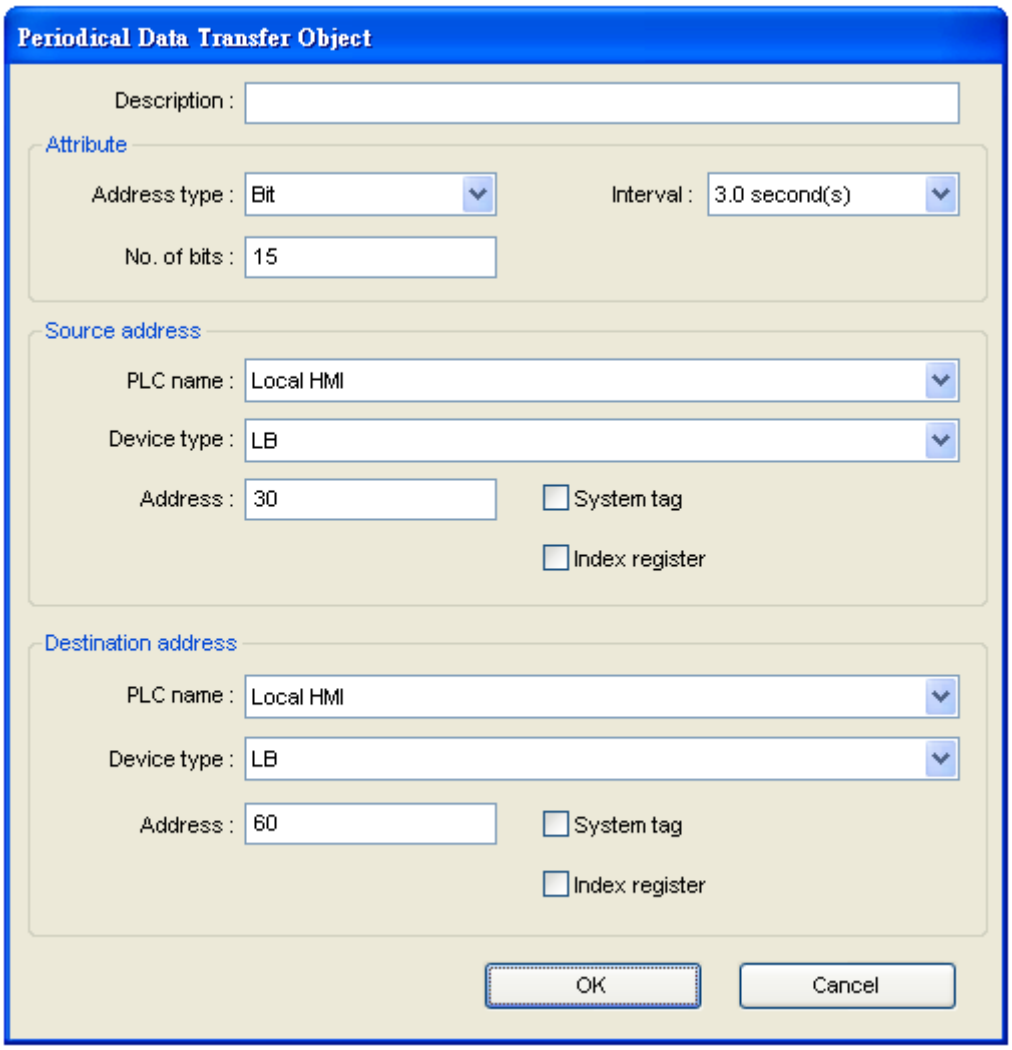




Press the “New…” button after correctly setting each item is the “General” tab, and a new Periodical Data Transfer object will be created.

Press the “New…” button in the “Periodical Data Transfer Object” dialogue box, there will appear the ”Periodical Data Transfer object” dialogue box, as shown

in the picture below, and set each item's attribute correctly, and a periodical data transfer object will be created.



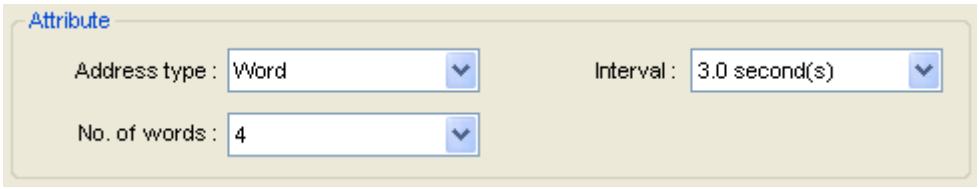
Attribute

[Address type]

Select the data type, there are word type or bit type to select.

[No. of words] or [No. of bits]

When select "Word type" for [address type], the transfer unit is word, set the transfer number in [No. of words]. See the picture below.



When select “Bit type” for [address type], the transfer unit is bit, set the transfer number in [No. of bits].

[Interval]

Select the transfer frequency, for example, select 3 seconds, the EB8000 will transfer data to the designated register every 3 seconds.

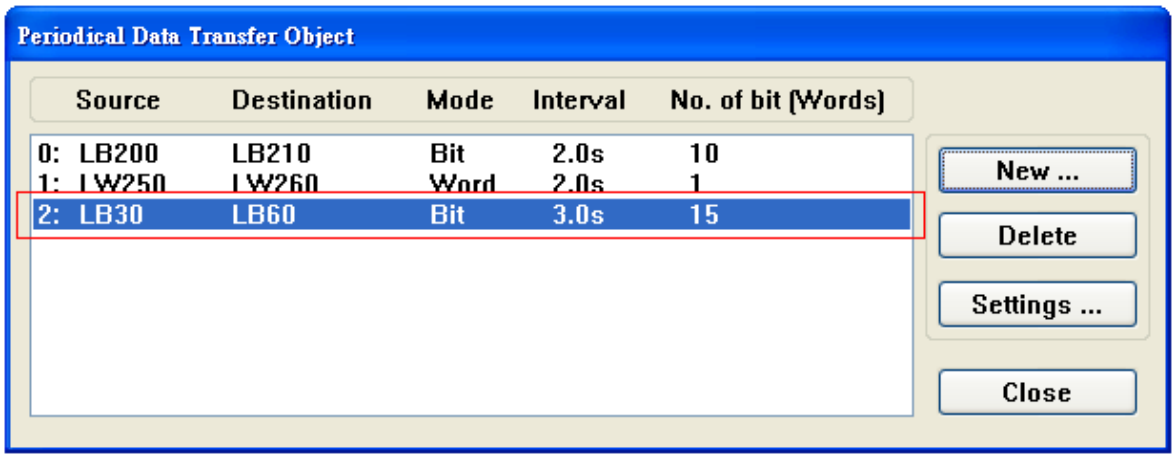
Source address

Source address for data transfer.

Destination address

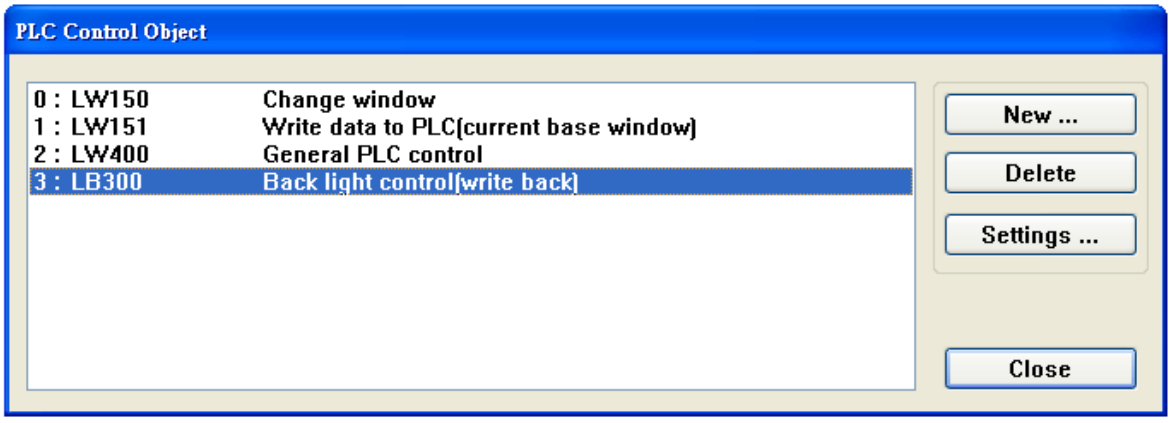
Destination address for data transfer.

After completing all settings and pressing the “OK” button, a new periodical data transfer object will be created and the object’s content can be seen in the “Periodical Data Transfer” dialogue box. The object will transfer the continuous 15 bit’s data of LB30 address to the LB60 address every 3 seconds.

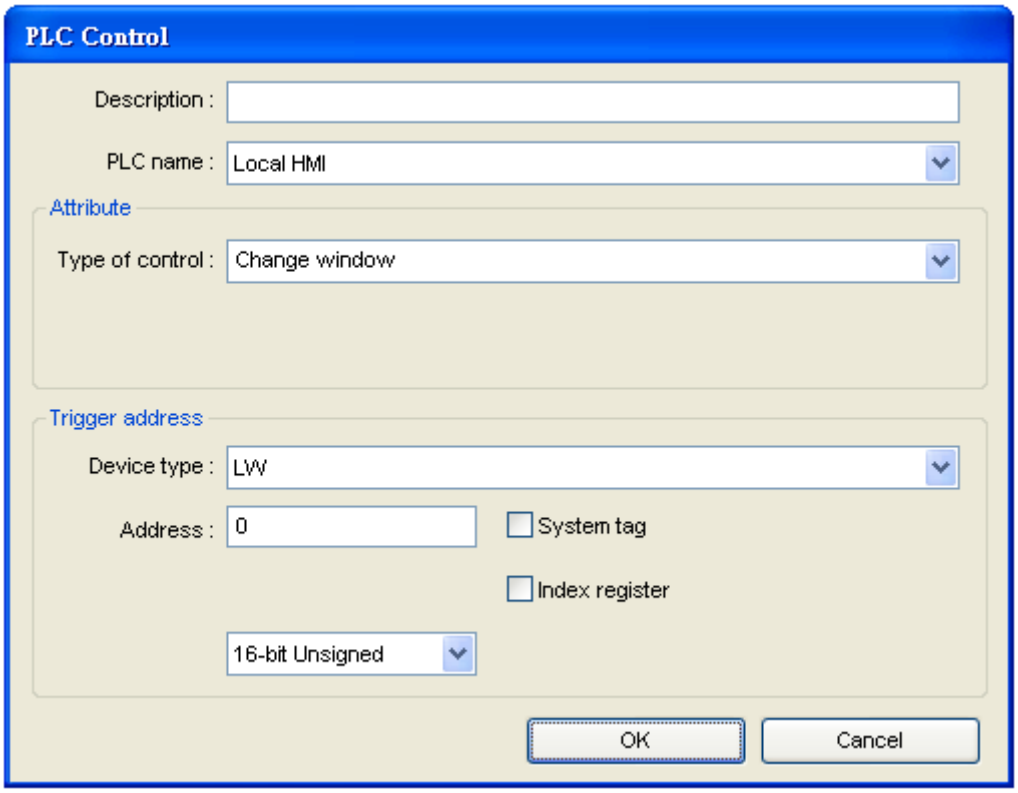


21. PLC Control Object

When the responding control is started up, the PLC Control Object will operate a particular action. Click the “PLC Control” icon and the “PLC Control Object” dialogue box, as shown in the picture below, will appear, then press the “New…” button and the “PLC Control” dialogue box will appear for users to set the object’s attributes. Press the OK button when all of the settings are completed and a new PLC control object will be created.



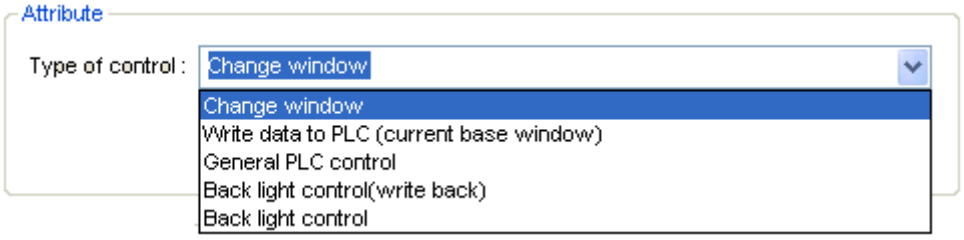
The picture below shows the “PLC Control” dialogue box which is displayed when pressing the “New…” button.



Attribute

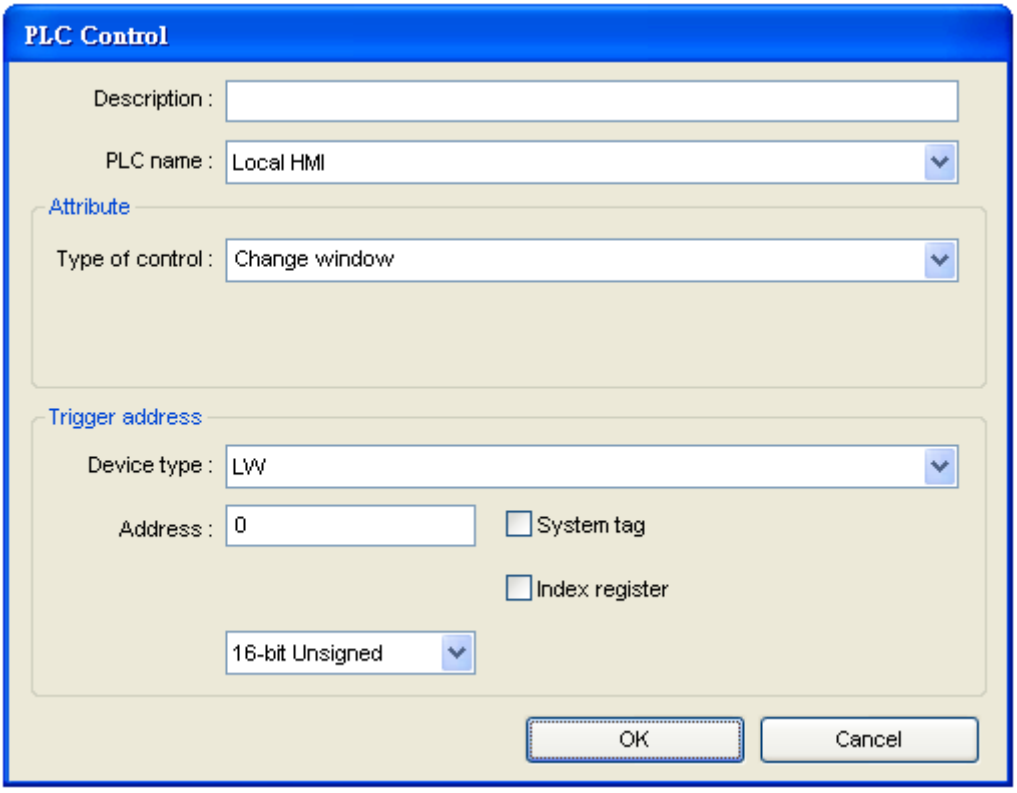
[Type of control]

To set the type of control. The available types of control for selection are listed in the picture below.



a. “Chang window”

To change base window. When the value of [Trigger address] is changed to the number of an effective window, the current window will be closed and switch to the window designated by the value of [Trigger address], and the number of the new window will be written to the specified address. (Refer to the following illustrations for related information.) For example, supposed that the number of the current window is 10, and see the object's settings in the picture below.



When the value of LW0 is changed to 11 due to other value, EB8000 will not only switch the base window to the window 11 but also change the value of LW1 to 11.

When the windows switch successfully, the write address for the number of the switching to window will relate to [Address] and data format. The table below shows the read address of the switching from window's number and the write address of the switching to window's number. "Address" represents the value of the register's address, for example, when the register's address is [LW100], "Address" is 100.

Data Format	Read address of the switching from window's number	Write address of the switching to window's number
16-bit BCD	Address	Address + 1
32-bit BCD	Address	Address + 2
16-bit Unsigned	Address	Address + 1
16-bit Signed	Address	Address + 1
32-bit Unsigned	Address	Address + 2
32-bit Signed	Address	Address + 2

When the state of [LB9017] is set to ON, the switching to window's number will not be written to the specified address.

b. "Write data to PLC (current base window)"

When switch to a base window, the base window's number will be written to the address designated by [Trigger address]

c. “General PLC Control”

The function enables users to use the value of the designated register to control the data transference between the PLC and the MT8000. The transference direction includes four types, see the table below:

Data transference code	Data transference direction
1	Data of PLC’s register →MT8000’s RW Register
2	Data of PLC’s register →MT8000’s LW Register
3	Recipe Data of MT8000’s RW → PLC’s register
4	Recipe Data of MT8000’s LW → PLC’s register

When this function is selected, the EB8000 will use the values of the four registers in row, starting from the address set in [Trigger address], to define the data transference direction, the data transference volume, the data sourcing address, and the address of data transference destination. The table below explains what the value of each register represents. [Trigger address] is used to indicate the address of PLC’s register, for example, when [Trigger address] = DM100, it means that the values of the four registers from DM100 to DM103 are used to define the content of data transference.

Address	Purpose	Description
[Trigger address]	To save the data transference code, and to define the data	It represents the type of data transference. As mentioned above, there are four registers, and this register is used to save control type code. When a new

	transference direction	code is written to the register, the MT8000 will operate the corresponding transference. When the transference is completed, the value of the register will resume as 0.
[Trigger address] + 1	To save the data transference size, the unit is word.	
[Trigger address] + 2	To save the slanting value of the sourcing address in data transference process.	The initial data sourcing address in the transference is [Trigger address] + 4 + Slanting value of the sourcing address In the example of OMRON PLC, if [Trigger address] is set to DM100, and the value of the [Trigger address] + 2 register, i.e. DM102, is 5, and the initial data sourcing address in the transference is DM109 (109=(100+4) +5).
[Trigger address] + 3	To save the initial address of the recipe data register (RW) or the local data register (LW)	In the example of OMRON PLC, if [Trigger address] is set to DM100, and the value of the [Trigger address] + 3 register, i.e. DM 103, is “100”，the initial addresses of the RW and LW in the transference will be RW100 and LW100 respectively.

Here is an example:

Supposed that it is necessary to use the “General PLC Control” function, we want to transfer the 16-word data of the OMRON PLC, starting with DM100, to the MT8000’s recipe register, starting with RW200. The setting steps are described as follows:

i. Firstly, supposed that we use four registers, starting with DM10, to control the data transference. Set a PLC control object on windows of a HMI by selecting “General PLC Control” in the “type of Control” and setting the read address to DM10.

ii. Secondly, confirm the size of the processed data and slanting value of the sourcing address and set DM11 to 16, which means the size of the transferred data is 16 words, then set DM12 to 86, which means the data’s sourcing address is DM100 (100 = 10 + 4 + 86), and set DM13 to 200, which means the destination address is RW200.

iii. Lastly, according to the data transferring direction, set data transference code to perform the process of the transference. If DM10 is set to 1, which means to transfer the data from PLC’s register to the MT8000’s RW register. If DM10 is set to 3, the transferring direction is reverse.

The rest two transference modes have a similar setting method, and the only difference is that the MT8000's RW register is changed to the local data register (LW).

d. "Back light control (write back)"

When the state of [Trigger address] is from OFF to ON, the MT8000 will turned off the CCFL backlight and the state of [Trigger address] will be set to OFF. When the CCFL backlight is turned off, users just have to touch the screen and the CCFL backlight will be turned on again.

e. "Back light control"

When [Trigger address] is from OFF to ON, the MT8000 will turn off the CCFL backlight, but because of being without the "write back" function, the state of [Trigger address] will not be set to OFF.

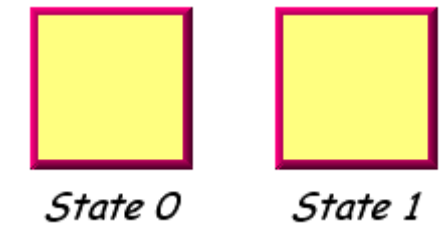
Chapter 14 Creating and Using Shape Library and Picture Library

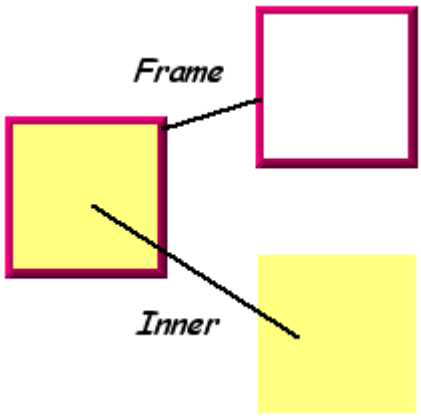
The EB8000 provides Shape Library and Picture Library functions to add the visual effects of objects. Each Shpae and Picture includes a maximum of 256 states. The picture below shows how to create Shape Library and Picture Library.

Refer to Chapter 10 - “Object’s General Attribute” for information about how to use Shape Library and Picture Library.

1. Creating Shape Library

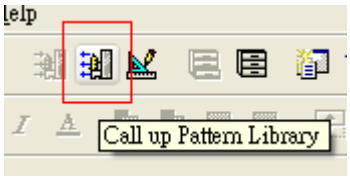
Shpae is a graph composed of lines, rectangles, circles and other drawing objects. A complete Shape is likely to be more than one state, and each state can include two parts: frame and inner. See the picture below.

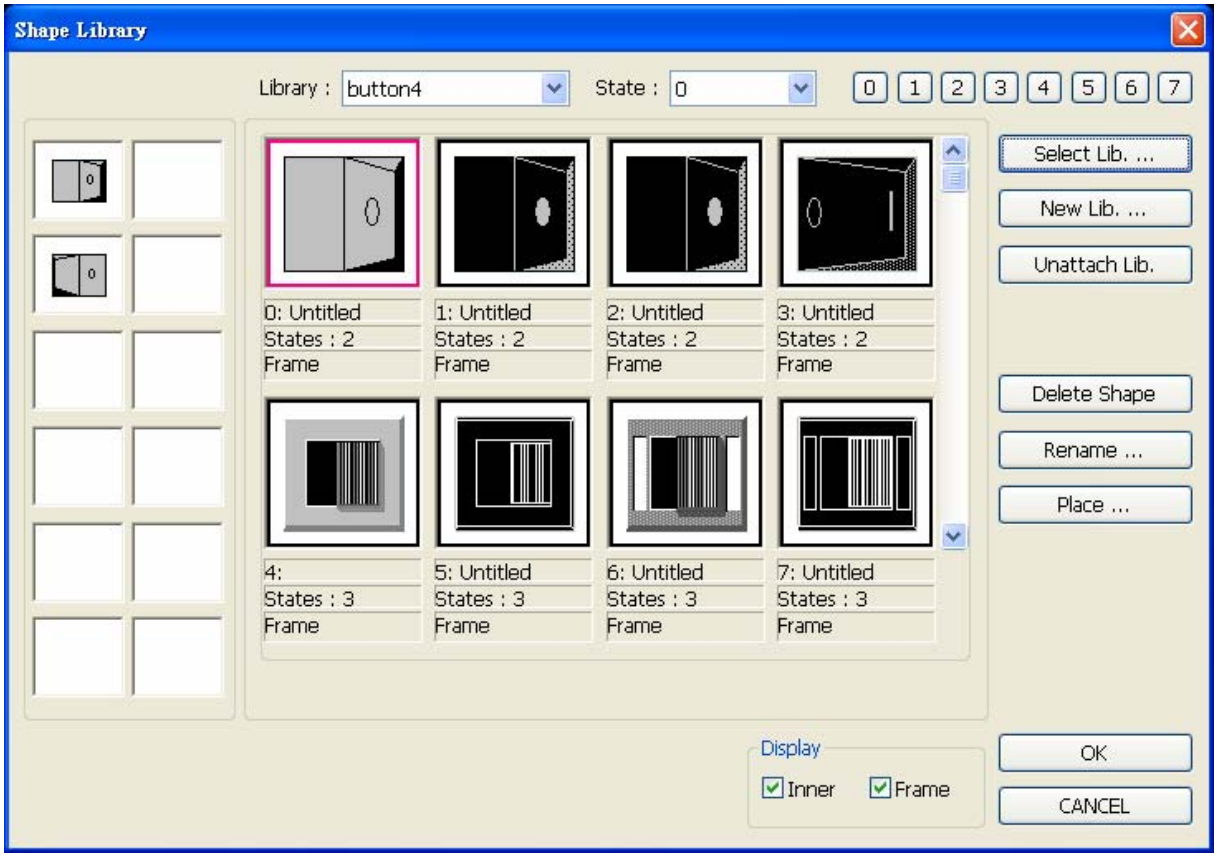




An object can be set to use alternatively the Shape’s frame or inner, or to use both at the same time. Click the “Shape Library” button on the toolbar, and the

“Shape Library” dialogue box, as shown in the second picture below, will be display.





[Library]

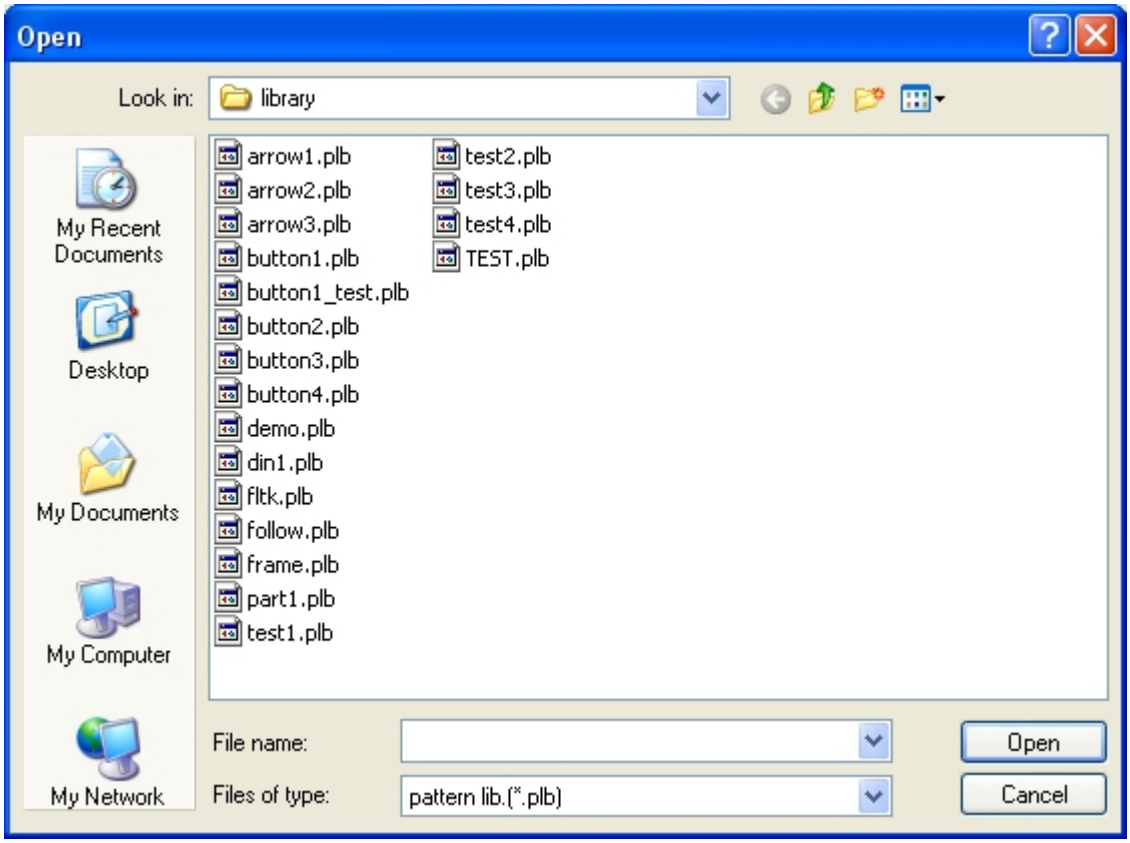
This is to select the source of a Shape from the Shape Library which has been added into the current project.

[State]

This is to select the state that the existing Shape wants to display. When there is no Shape of a Graph displayed in the window, it means that the Shape does not exist or the state of the Shape is not defined yet.

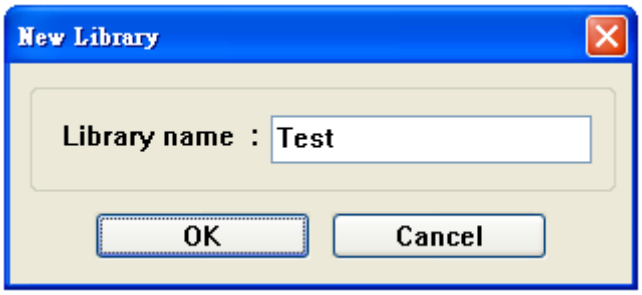
[Select Lib. …]

Click the [Select Lib. ...] button, and the following picture will be displayed for users to select the Shape Library to add to the current project.



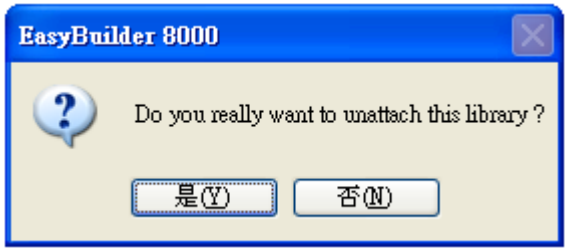
[New Lib. ...]

Click the button, and the following picture will be displayed for users to add a new empty Shape Library.



[Unattach Lib.]

Click the button, and the following picture will be displayed for users to decide whether or not to delete the Shape Library in [Library] from the current project.

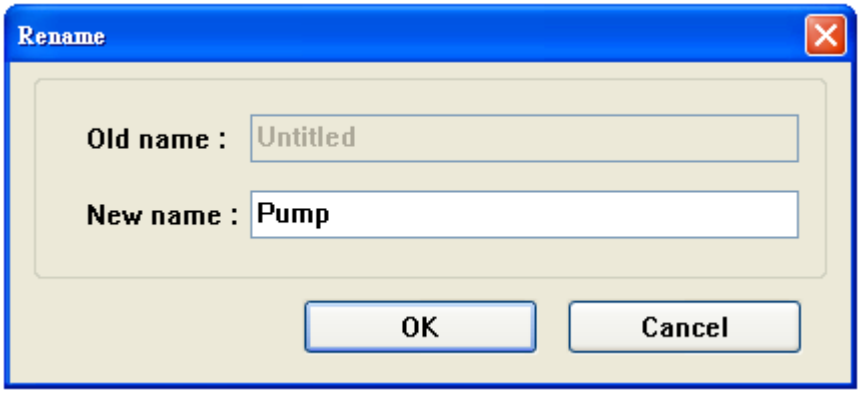


[Delete Shape]

The button is used to delete the selected Shape.

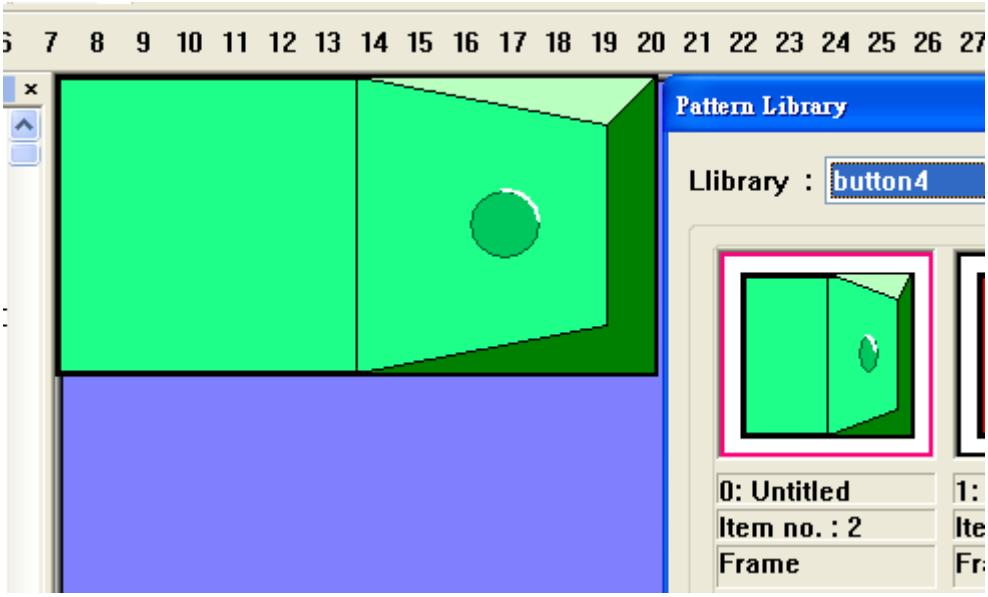
[Rename …]

Click the button, and the following picture will be displayed for users to rename the selected Shape.



[Place …]

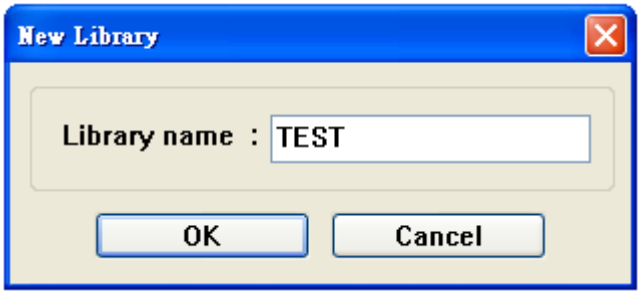
This button is used to export the selected Shape to the window in operation. See the picture below.



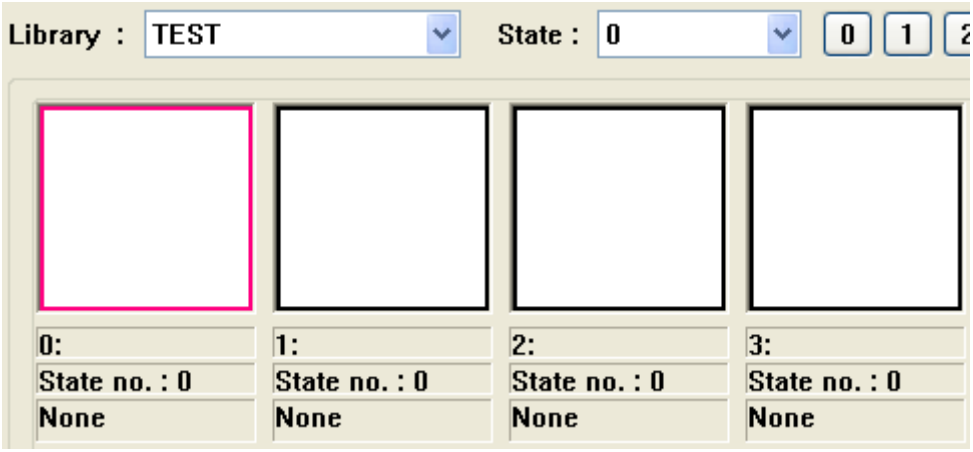
Here is an example of adding a Shape with two states to a new Shape Library to show how to create a new Shape Library and to add a new Shape to it.

Step 1

Click [New Lib. ...] and input the name of the new Shape Library when the following dialogue box is displayed.

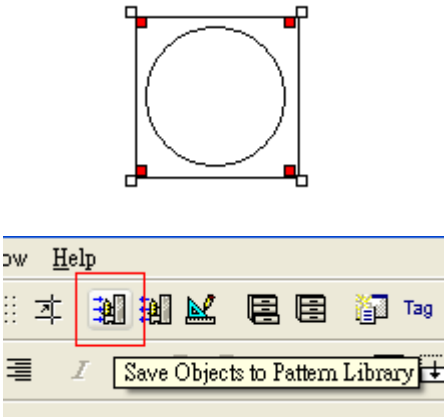


Then, a new Shape Library “TEST” will be added to the Shape Library Manager dialogue box, but at this moment, there are no Shapes in the library.

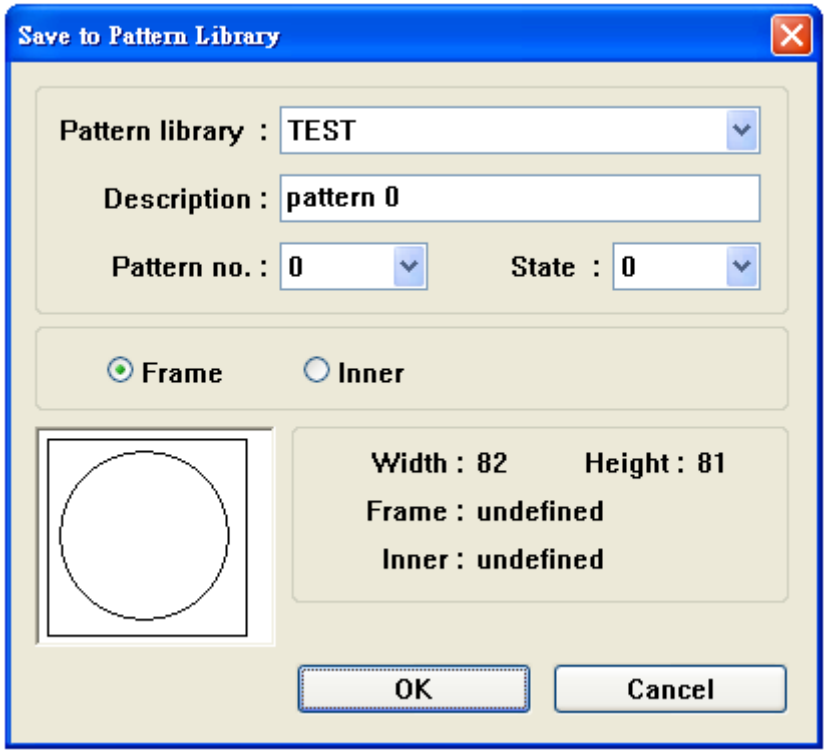


Step 2

Add a state to the selected Shape. First, using the drawing tools to draw a graph in the window and select the graph which wants to be added to the Shape Library.



Then, chick the “Save Objects to Shape Library” button on the toolbar and the following dialogue box will be displayed.



[Shape library]

This is to select the Shape Library for the graph to add to, and here the Shape Library “TEST” is selected.

[Description]

The name of the Shape.

[Shape no.]

This is to select the Shape out of the Shape Library “TEST” where the graph will be added to.

[State]

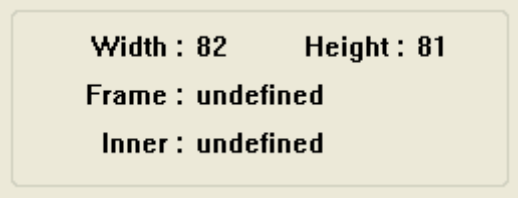
This is to select the state of the Shape which the graph wants to be. Here the state is set for 0. The EB8000 provides 256 states for each Shape.

[Frame]

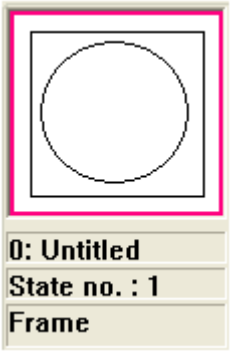
When [Frame] being selected, the graph will become a frame for the Shape.

[Inner]

When [Inner] being selected, the graph will become an inner for the Shape.

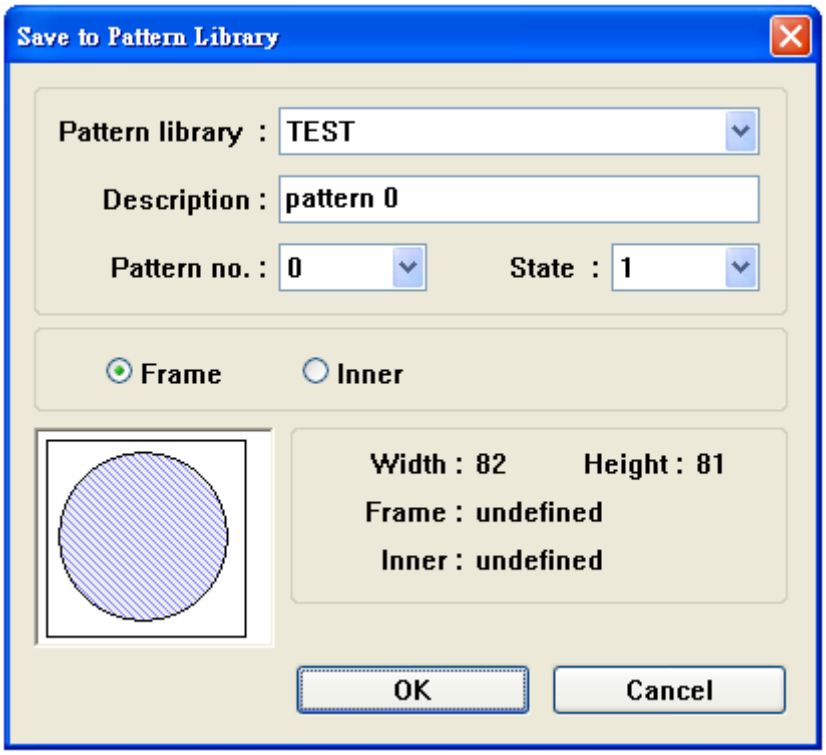


The above picture shows that neither frame nor inner is defined in the current state (state 0) of the Shape No. 0 in the Shape Library “TEST”. But see the picture below, after clicking the OK button, the graph will be added to the Shape Library; besides, it also shows that the Shape No.0 has only one state and frame has also been defined.

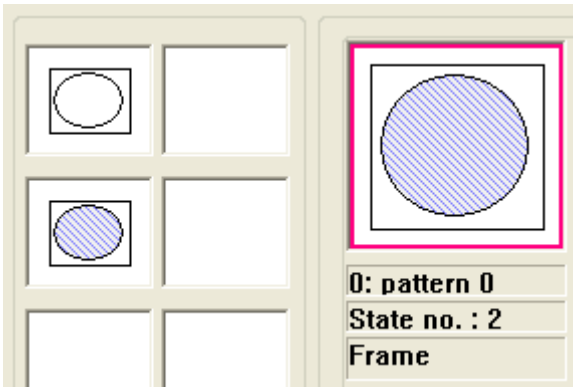


Step 3

The same process as in the Step 2, but the new graph has to be defined as state 1, refer to the following picture.

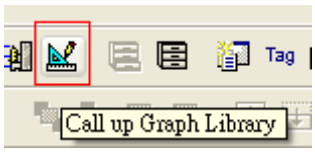


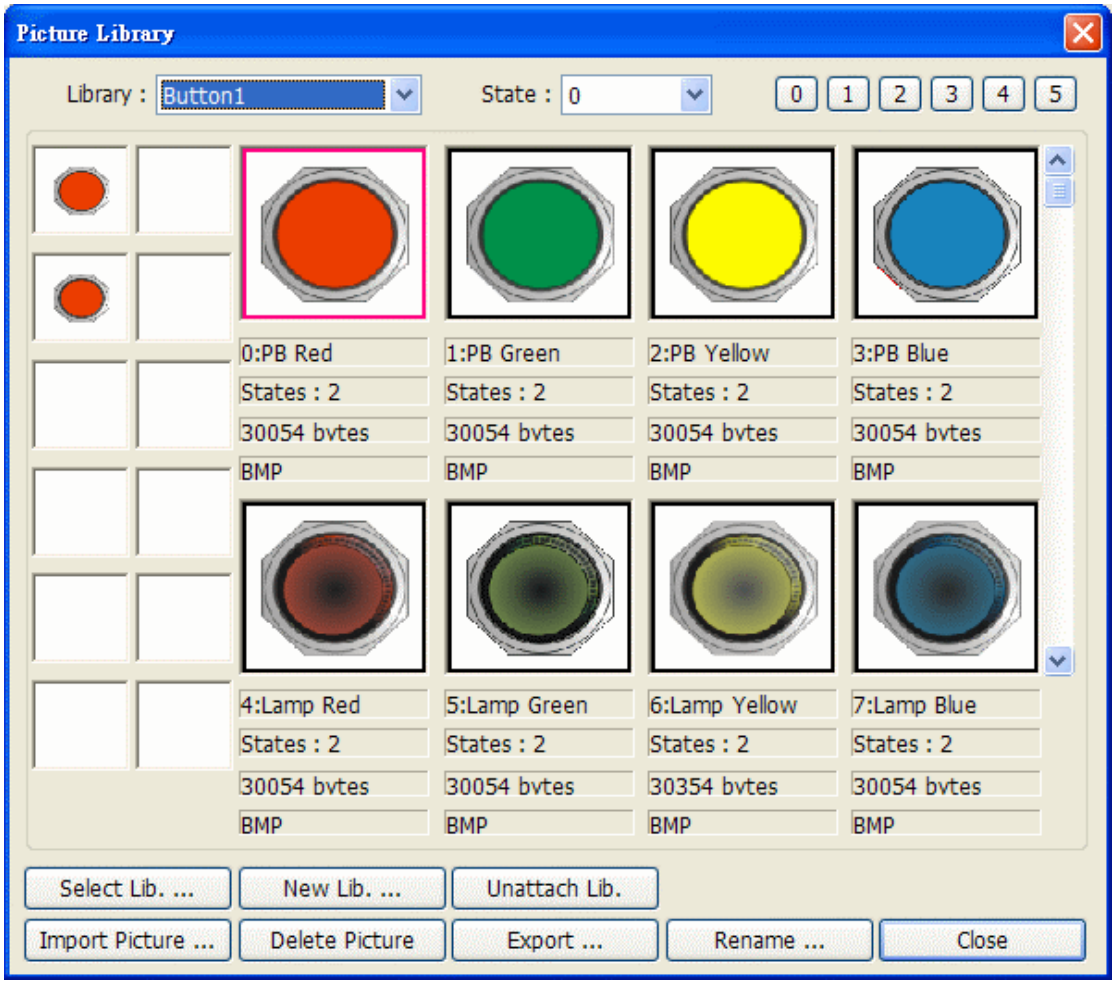
After the whole process that is described above is completed, a complete Shape is created. See the following picture.



2. Creating Picture Library

Click the “Picture Library” button on the toolbar, and the “Picture Library” dialogue box, as shown in the second picture below, will be displayed.





[Library]

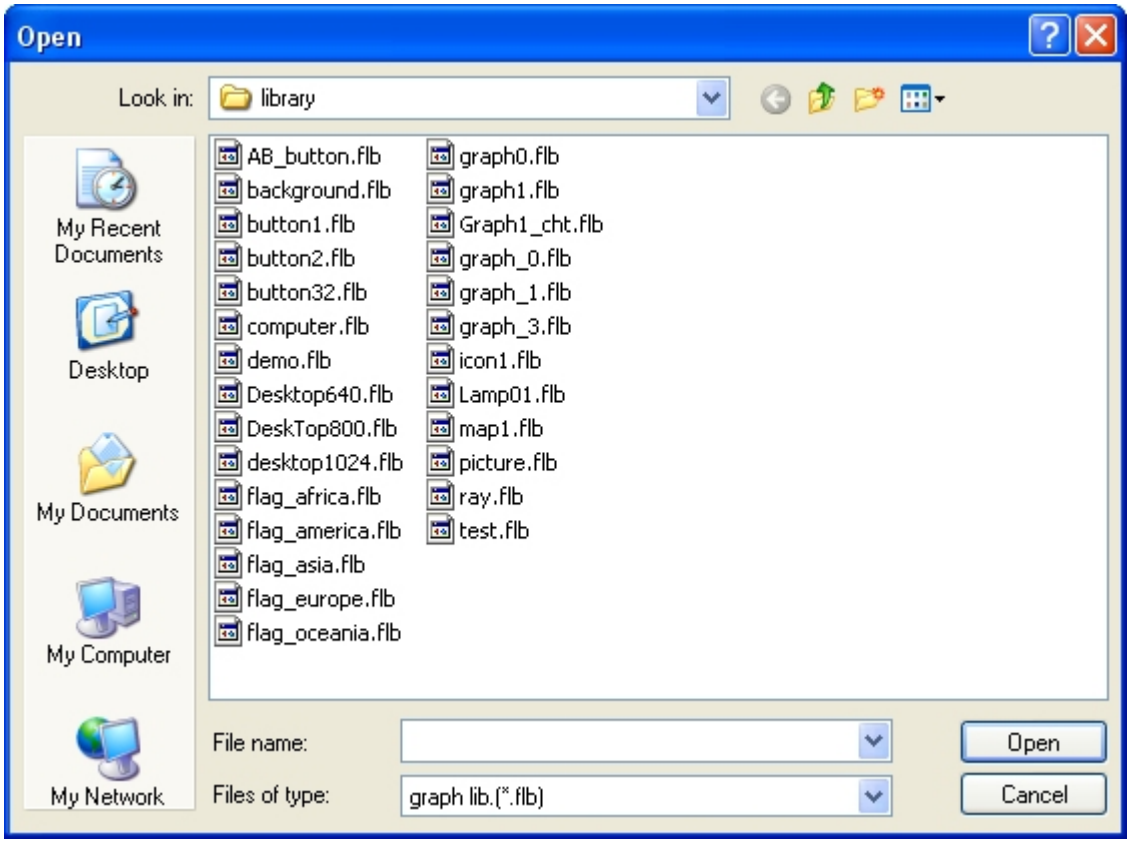
This is to select the source of a graph from the Picture Library which has been added into the current project.

[State]

This is to select the state that the existing graph wants to display. When there is no picture displayed in the window, it means that the picture does not exist or the state of the picture is not defined yet.

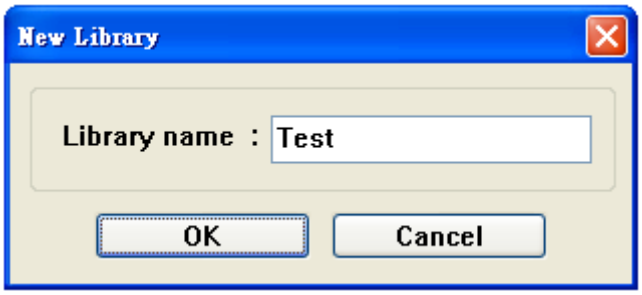
[Select Lib. …]

Click the [Select Lib. …] button, and the following picture will be displayed for users to select the Picture Library to add to the current project.



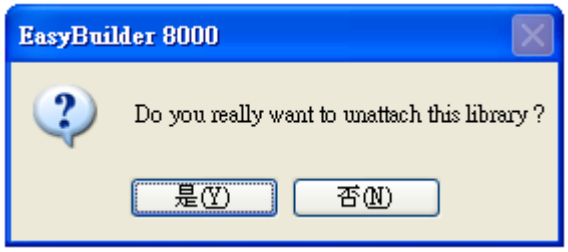
[New Lib. …]

Click the button, and the following picture will be displayed for users to add a new empty Picture Library.



[Unattach Lib.]

Click the button, and the following picture will be displayed for users to decide whether or not to delete the Picture Library in [Library] from the current project.



[Import Picture …]

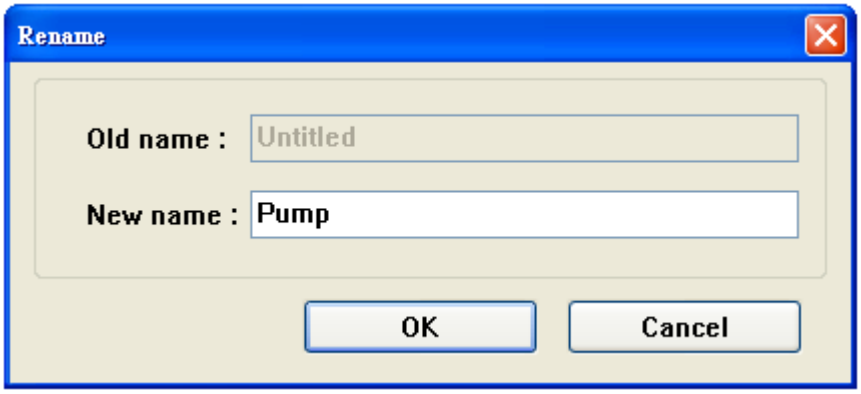
The button is used to add a new picture to the Picture Library

[Delete Picture]

The button is used to delete the selected picture.

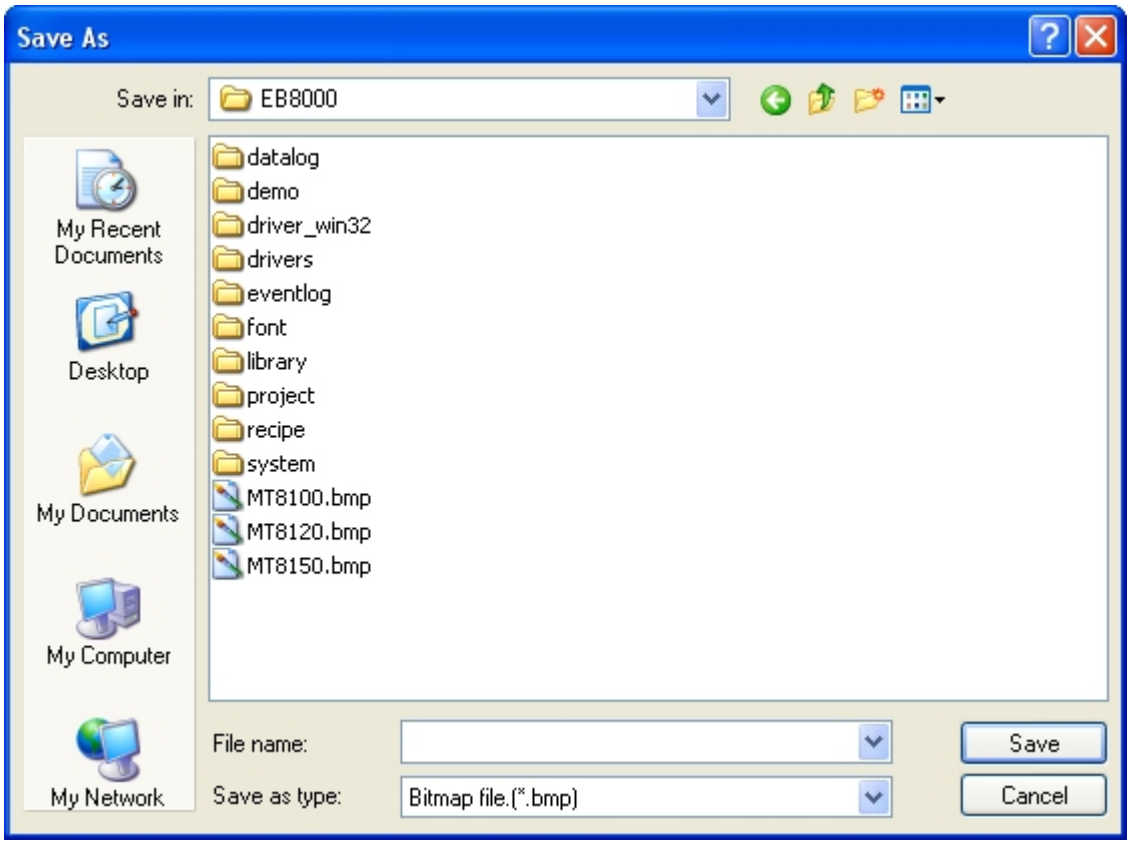
[Rename …]

Click the button, and the following picture will be displayed for users to rename the selected picture.



[Export …]

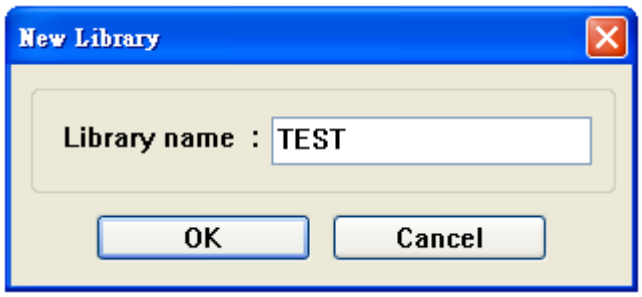
This button can be used to export the selected picture to the appointed place, as shown in the picture below, by that way users can get the original picture.



Here is an example of adding a picture with two states to a new Picture Library to show how to create a new Picture Library and to add a new picture to it.

Step 1

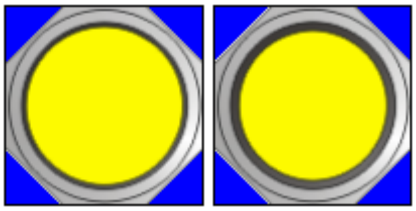
Click [New Lib. …] and input the name of the new Picture Library when the following dialogue box is displayed.



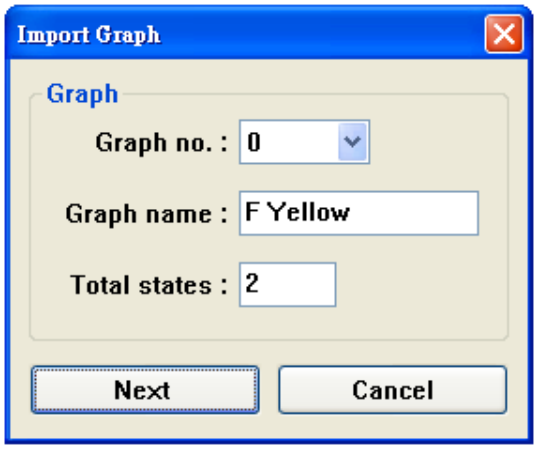
Then, a new Picture Library “TEST” will be added to the Picture Library Manager dialogue box, but at this moment, there are no pictures in the library.

Step 2

Get the needed graphs ready with the drawing tools first; suppose the two graphs in the following picture are used to represent the state 0 and the state 1 respectively.

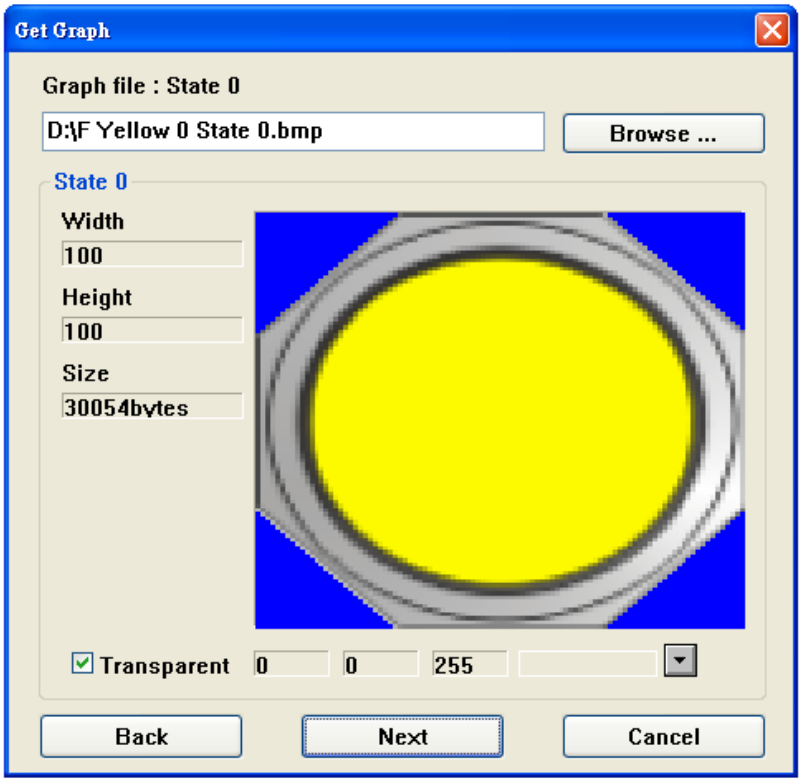


Click the [Import Picture…] button first, and a dialogue box as shown in the picture below will be displayed, then set [Total states] for 2, meaning the picture includes 2 states, and last click [Next].



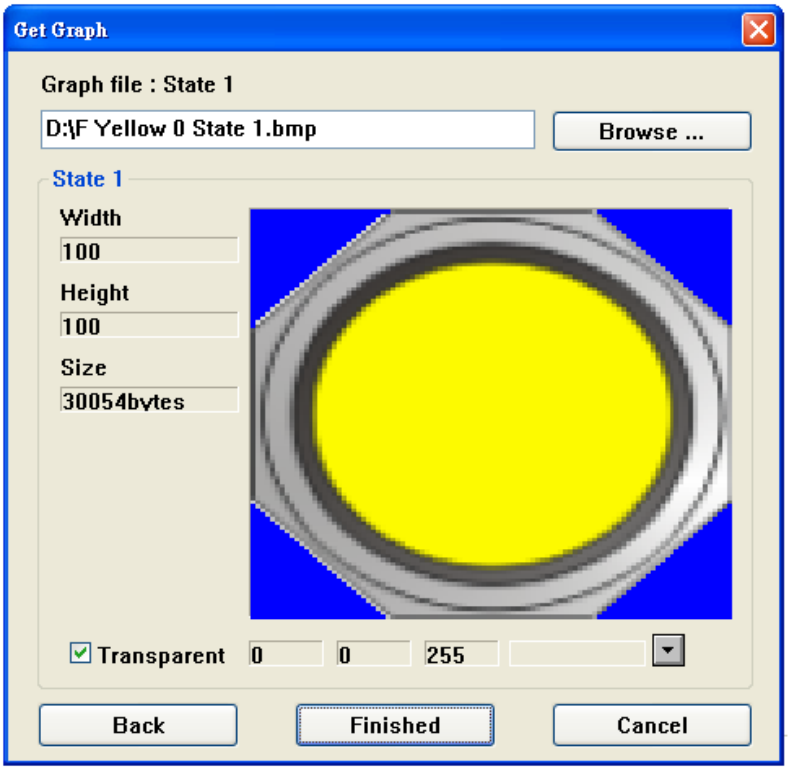
Step 3

When the dialogue box as shown in the following picture is displayed, select the source of a picture of which the state is 0, and select the correct transparent color. In the example below, the blue color RGB (0, 0, 255) is a transparent color. After the setting of the state 0 is completed, click the [next] button to continue the setting of the other state.

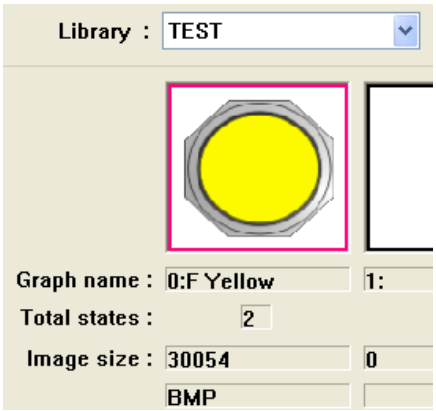


Step 4

Same as the last step, select the source of a picture of which the state is 1 and select the correct transparent color for it. The work of creating a picture with two states is completed after clicking the [Finished] button,

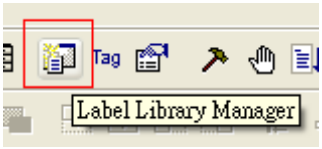


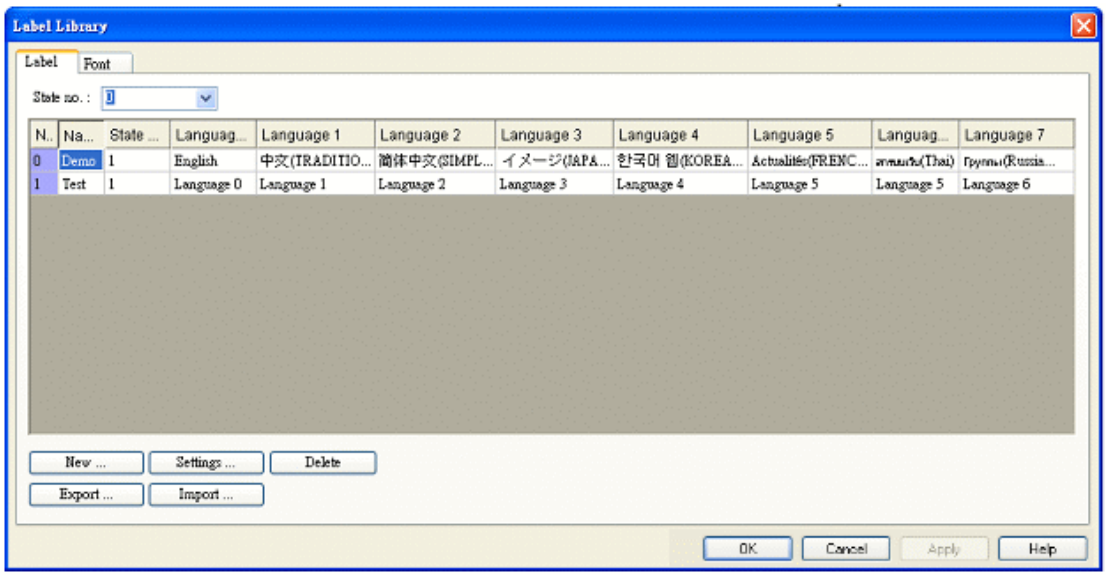
A complete picture, as shown in the picture below, will be created after all of the steps that are described above are done accordingly. Now the new picture “F Yellow” can be found in the Picture Library Manager dialogue box, and from the information we can know the picture is in the bitmap format and with two states.



Chapter 15 Label Library & Using Multi-Language

Label Library is used in the Multi-Language environment. Users can design the content of Label Library according to the actual demands. Select the needed label from Label Library on some occasion where text is needed. When operating the MT8000, the system can display the text which corresponds to the then language in use according to the settings of Label Library. The EB8000 can support displaying the corresponding text in 8 different languages simultaneously. Click the “Label Library Manager” button on the toolbar and a dialogue box, as shown in the picture below, will be displayed.





[State no.]

The function is to indicate the current state; each Label has a maximum of 256 states.

[New …]

The function is to add a new Label.

[Settings …]

The function is to change the content of Label.

[Delete]

The function is to delete the specified Label.

[Export]

The function is to export the whole content of the specified Label Library in the CSV format to the appointed storage space.

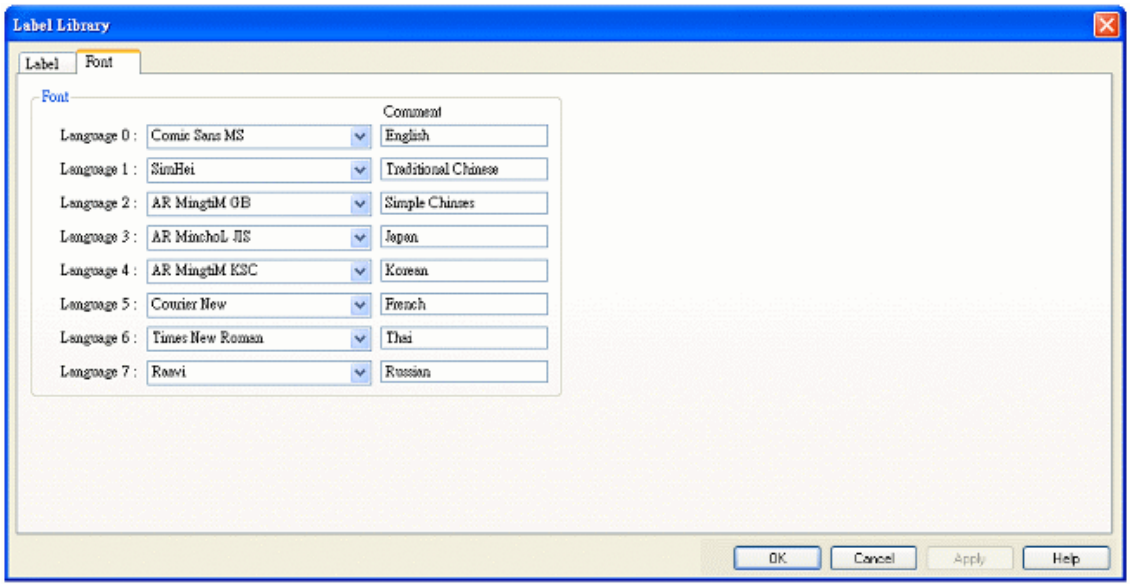
[Import]

The function is to import the existing Label Library which is already in the CSV format to the current project (MTP).

The two Labels “Demo” and “Test” can be seen existing in the “Label Library” dialogue box, and “Demo” includes 8 languages which are: English, traditional Chinese, simplified Chinese, Japanese, Korean, French, Thai, and Russian.

Settings of Label Library’s Font

See the picture below, different fonts can be selected for different languages.

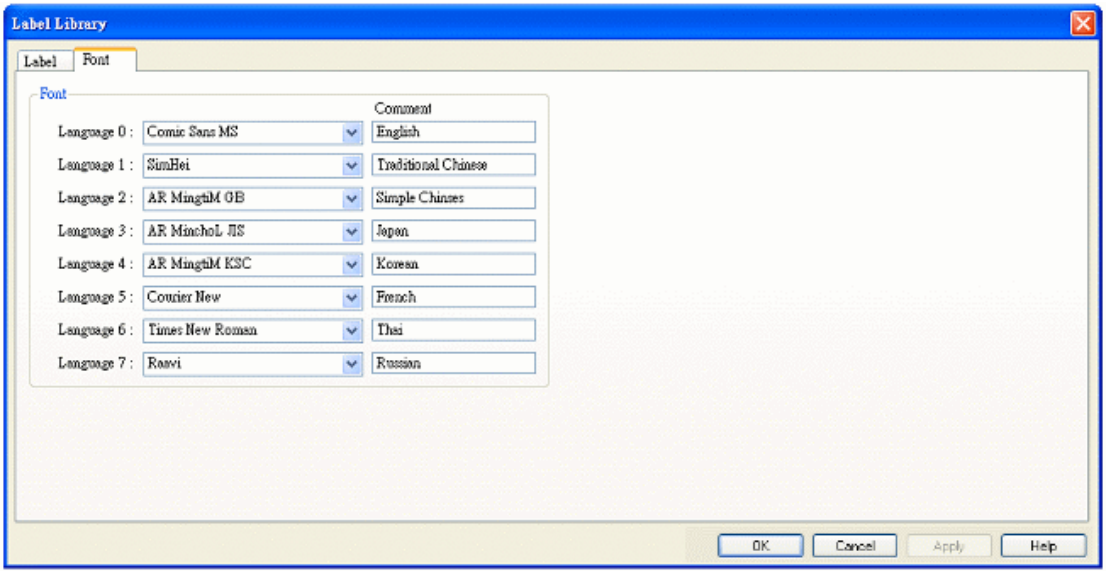


[Font]

The [Font] tab is to set the font for different languages in the Multi-Language environment.

[Comment]

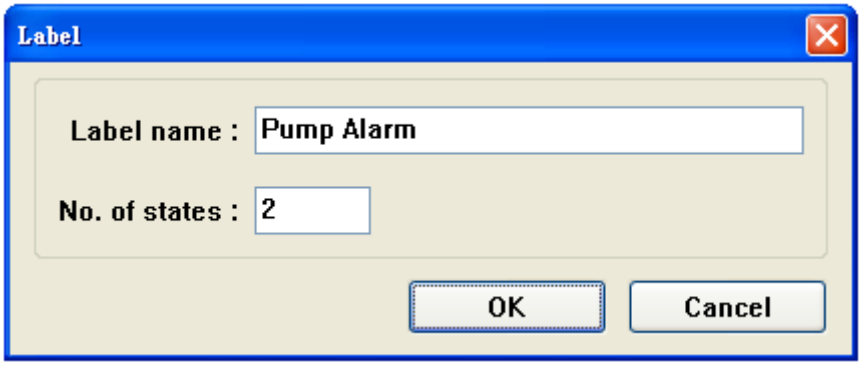
The comment for each font.



Creating Label Library

The following shows how to create Label Library.

At first open the “Label Library” dialogue box and click [NEW…], then the setting dialogue box, as shown in the picture below, will be displayed. Click the OK button when the settings are certain.



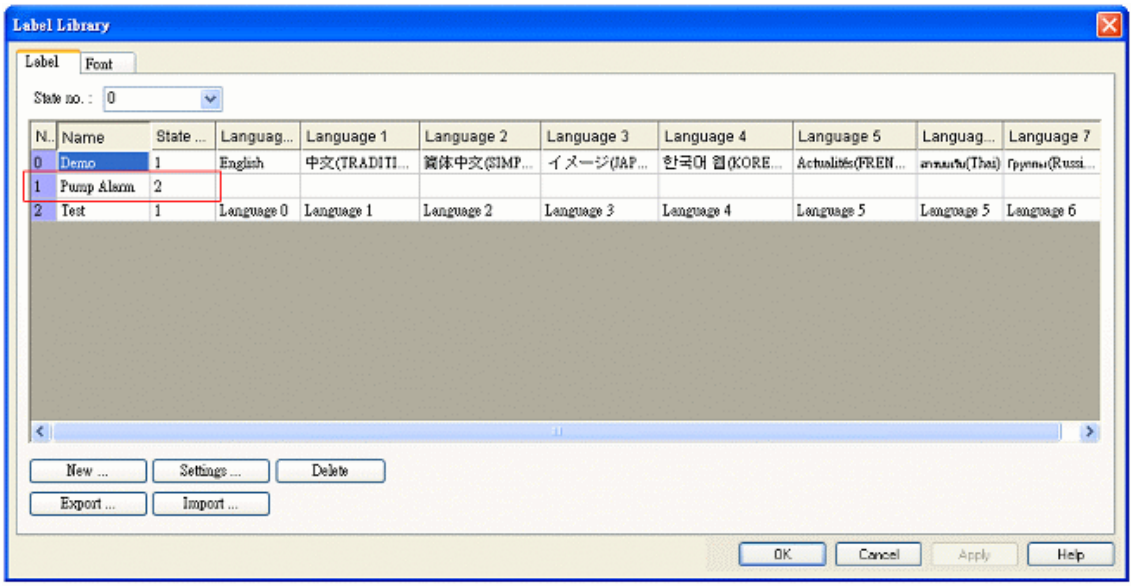
[Label name]

Label's name; in the example above, the Label is named as "Pump Alarm".

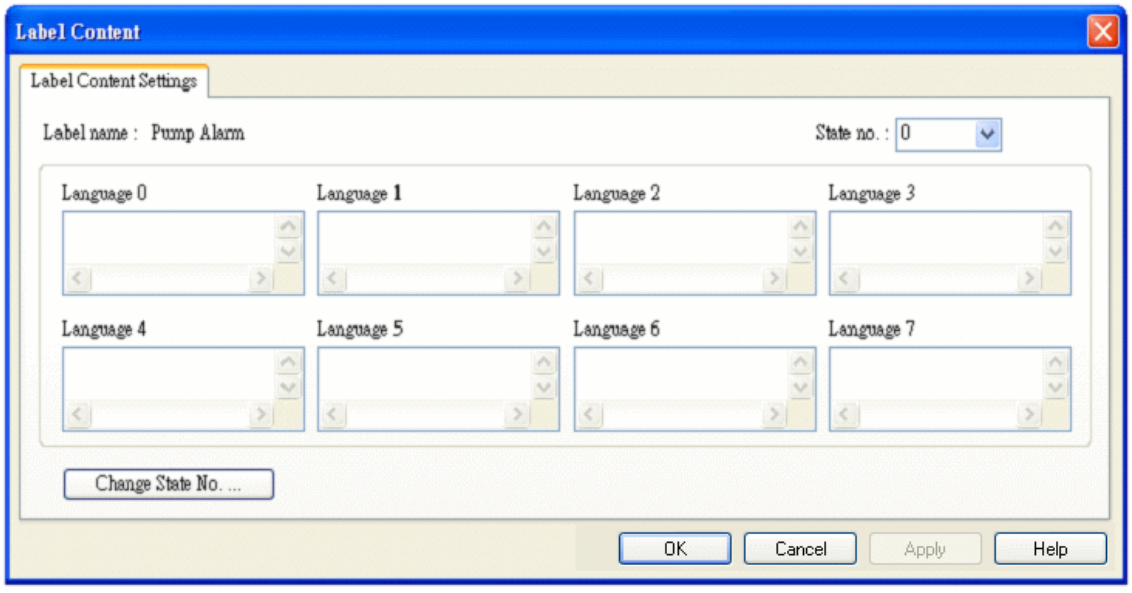
[No. of states]

The number of states possessed by the Label.

When the process is complete, a new Label "Pump Alarm" with 2 states will be added to the Label Library. See the picture below.

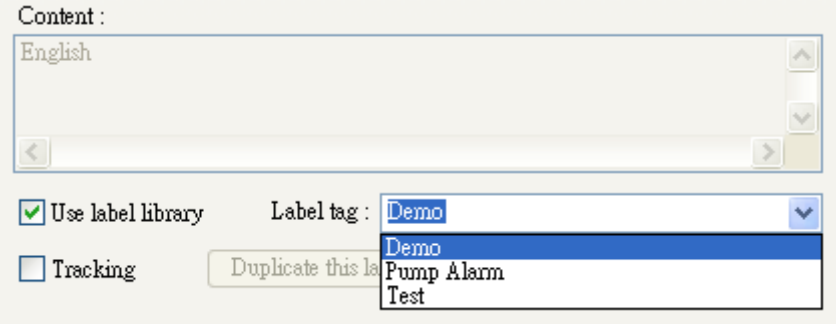


At last, select "Pump Alarm" and click [Settings …], and the setting dialogue box, as shown in the picture below, will be displayed for users to set up the corresponding language content.

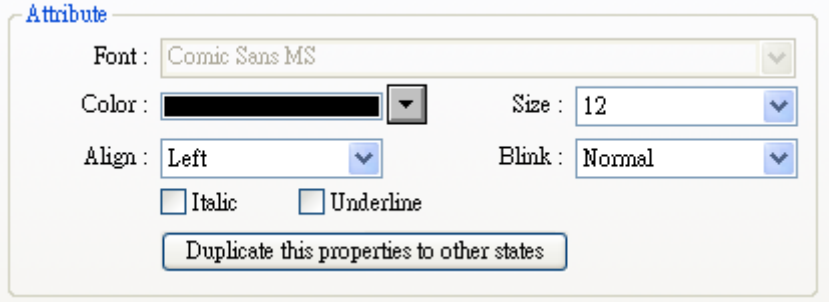


Using Label Library

When there are already some defined labels in Label Library, users can find out those Labels in [Label tag] by selecting [Use label library] in the object's [Label] tab.

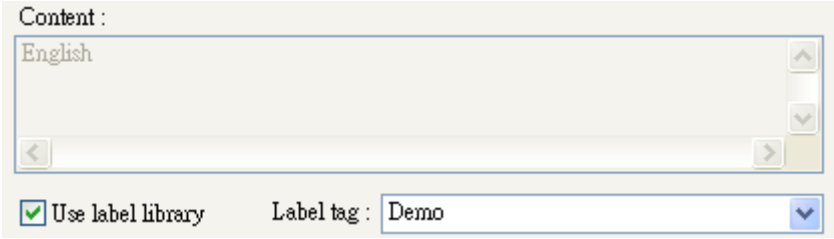


After selecting these Labels, what that is shown in [Content] is the content of selected label, and the settings of the font in use are also included in the Label Library.

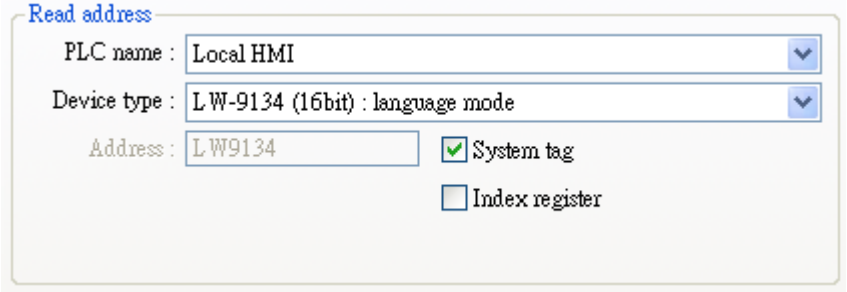


The use of Multi-Language

When users want to have the multi-language effect on the content of the object's text, besides using the Label Library, it has to use the system reserved register [LW9134]. The available value range of the [LW9134] can be set from 0 to 7, and different value of [LW9134] corresponds to the different Language. The picture below demonstrates a simple example that shows how to use the multi-language. At first, create a Text Object and set the content of it, and the Label in use at this time can be seen from the Label tag.



Next, create a Numeric Input Object, then refer to the picture below to set its Read address, and you will see the Read address in use at this time is the system reserved register [LW9134].

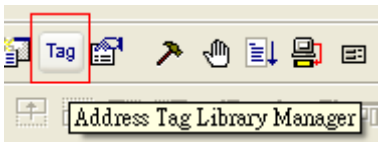


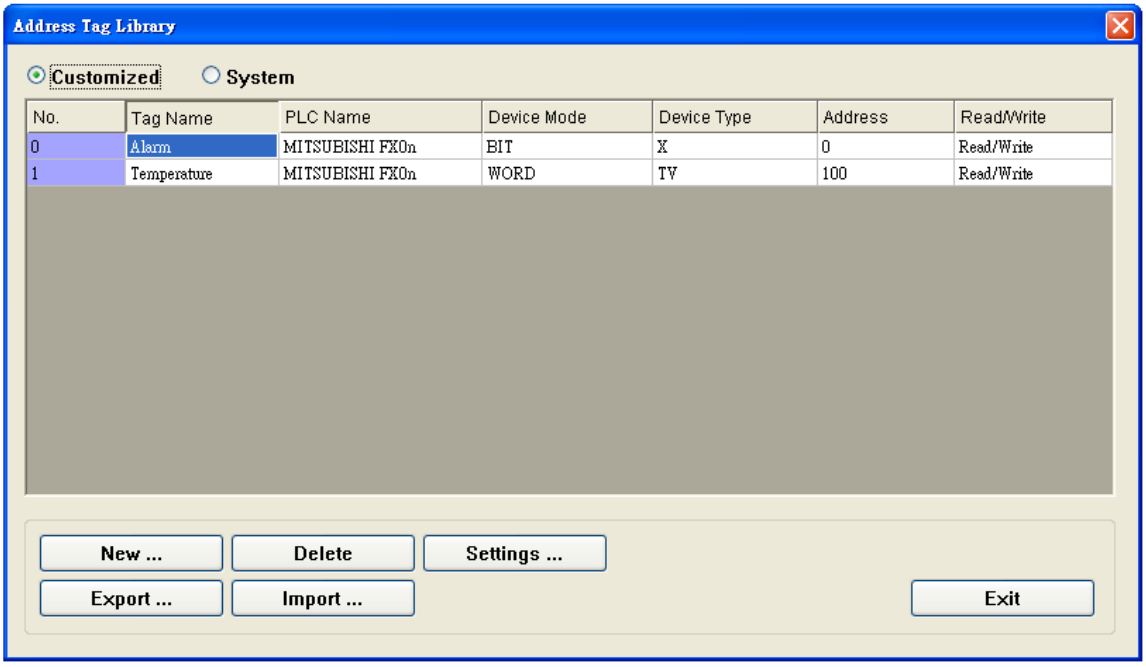
And afterwards, the simulation effects of the project will be like the pictures below. When change the value of [LW9134], the displayed content of the Text Object will be also changed automatically.

Chapter 16 Creating and Using Address Tag Library

1. Creating Address Tag Library

Normally, at the beginning of designing a project, the common address is defined in the Address Tag Library. It is not only to save users repeating the address input but also to enhance the utility of object related information. Click the “Tag” button on the toolbar to call up the “Address Tag Library” dialogue box. See the pictures below.





[Customized]

This is to display the Address Tags defined by users.

[System]

This is to display the Address Tags of the system.

[New …]

This is to add a new Address Tag.

[Delete]

This is to delete a selected Address Tag.

[Settings …]

This is to change the selected Tag.

[Export …]

This is to export the current Address Tag Library in CSV format to the appointed space.

[Import …]

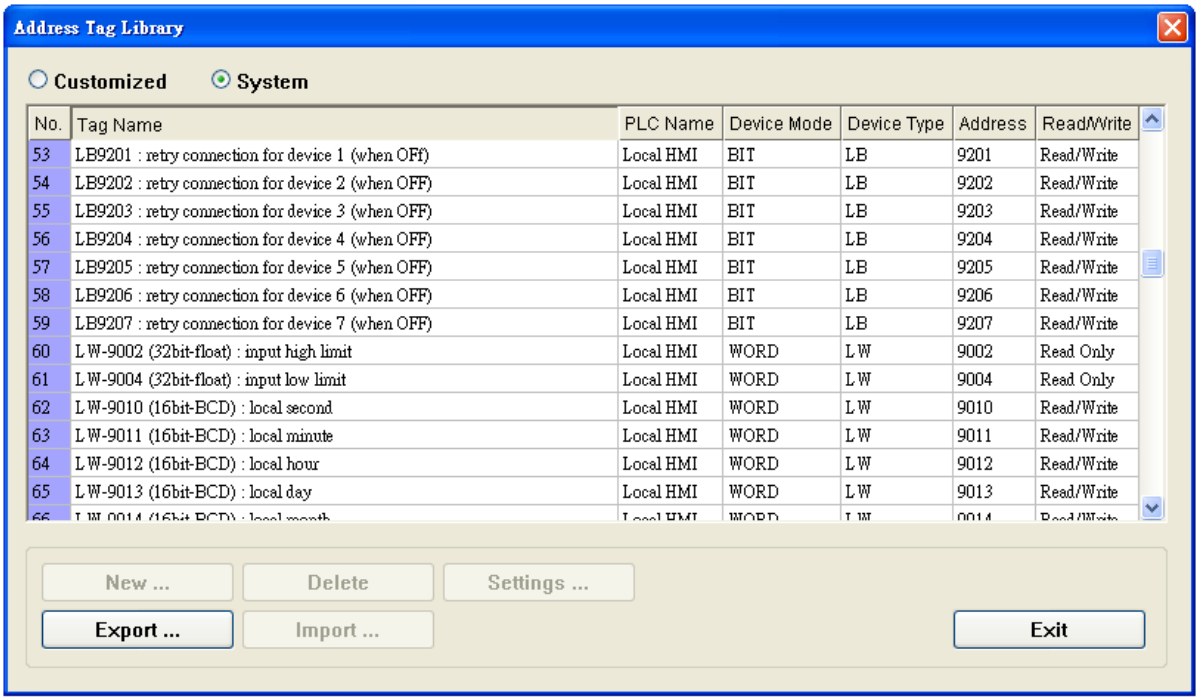
This is to import an Address Tag Library in CSV format to the current project.

The picture above shows the content of two existing customized Address Tags in the library. And the following explains the meaning of terms.

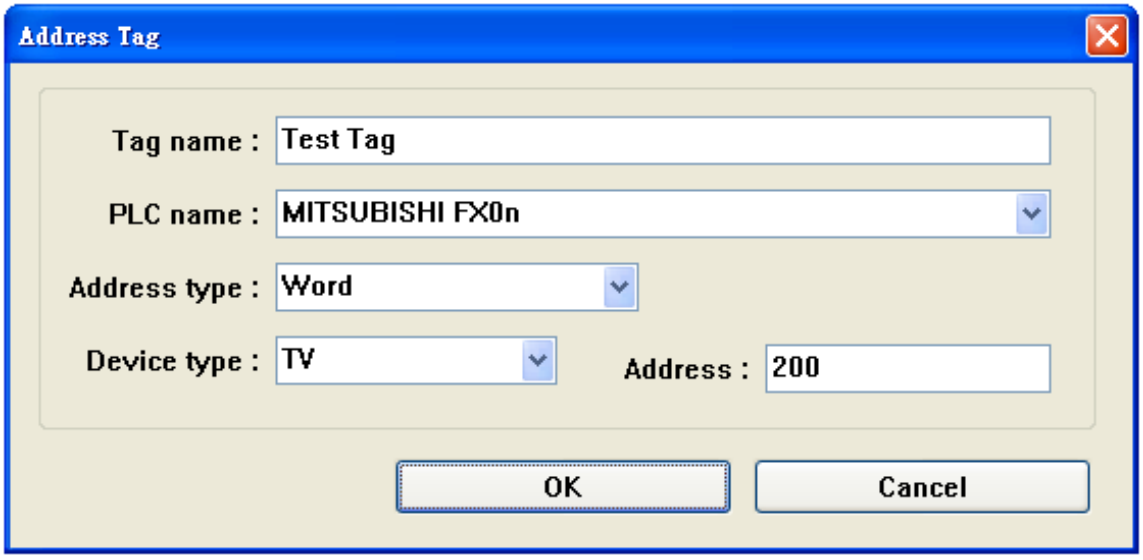
1	Temperature	MITSUBISHI FX0n	WORD	TV	100	Read/Write

No. Tag name PLC Name Device Mode Device Type Address Read/Write

The picture below indicates another kind of Address Tag which is the system reserved register.



Before using the Address Tag Library, users have to add the content of the library. Click the [New…] button, and the “Address Tag” dialogue box, as shown in the picture below, will be displayed.



[Tag name]

The Address Tag’s name.

[PLC name]

The PLC’s name; can be selected from the device table.

[Address type]

Address type; there are “bit type” and “word type” for choice.

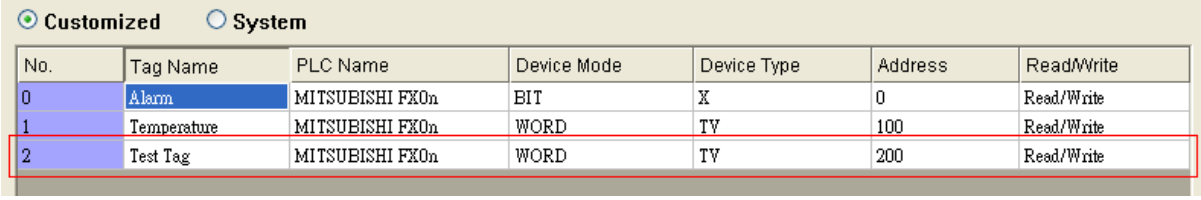
[Device type]

Device type; the selection is related to [PLC name] and [Address type].

[Address]

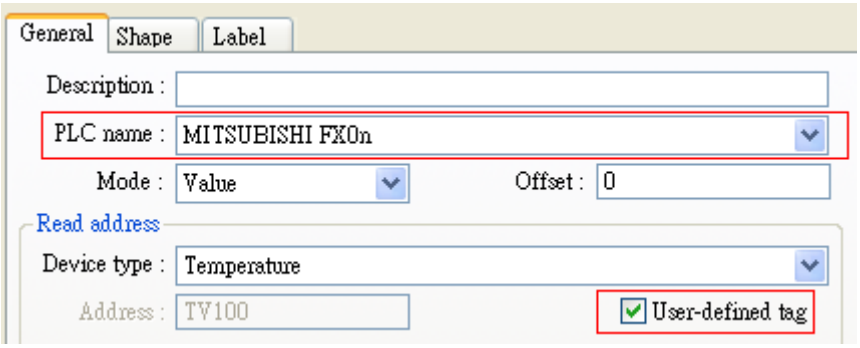
The content of address.

Click the OK button when the settings are done, and a new tag will be found in the customized library. See the picture below.

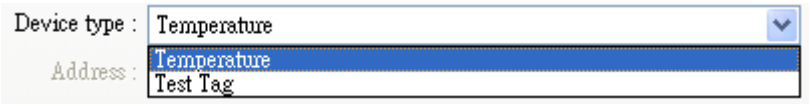


2. Using Address Tag Library

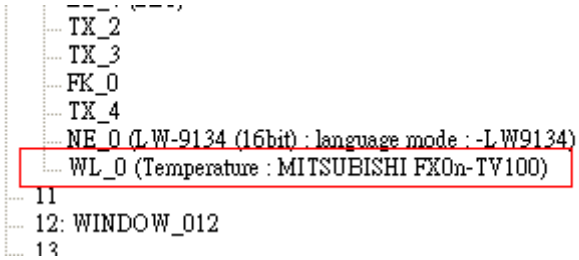
After creating the Address Tag Library, set up the connection PLC device which is related to the customized Tag in the [General] tab of the “Object Attributes,” where the [User-defined tag] check box can be found and by selecting it, users can make use of these address tags. See the picture below.



Then, as shown in the picture below, there are some items in the [Device type] tab for selecting.



When the settings are completed, the object information window will show the name of the Address Tag used for the object. See the picture below.



Chapter 17 Transferring Recipe Data

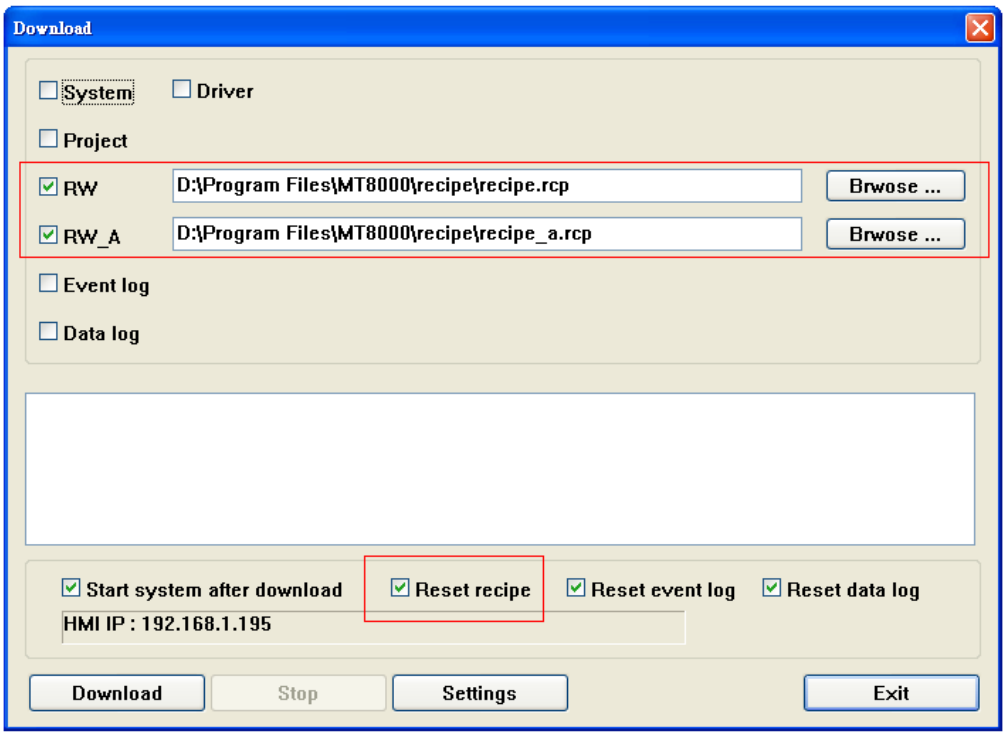
Recipe Data are stored in RW and RW_A memory, the way of reading and writing Recipe Data is the same as operating the normal Word Register. The difference is that Recipe Data will be saved in the recipe memory when the machine shuts off and the data saved in RW and RW1 will remain the last record after the machine operates again.

The size of Recipe Data in both RW and RW1 are 64k words. Users can update Recipe Data by using CF Card or Ethernet and then update the PLC's data according to the new Recipe Data. Users can also upload Recipe Data to the appointed address; furthermore, users can save the PLC's data in recipe memory. The following will explain all of the ways of operating recipe data.

1. Updating Recipe Data by Using Ethernet.

Go to [Download] in Project Manager. Select [RW] and [RW_A] and designate the files which you want to download from the source files. After the downloads are done successfully, start up the machine again, and the content of RW and RW_A will be updated.

When [Reset recipe] is selected, before moving onto any download process, the EB8000 will set all the data of [RW] and [RW_A] for 0 first.



2. Updating Recipe Data by Using CF Card or USB Disk

Please refer to the section of Project Manager for related information.

3. Transferring Recipe Data

Using the [Trigger Data Transfer] object to transfer Recipe Data to the appointed address, or saving the data of the appointed address in [RW] and [RW_A] as well. Refer to the [Trigger Data Transfer] section for related information.

4. Saving Recipe Data Automatically

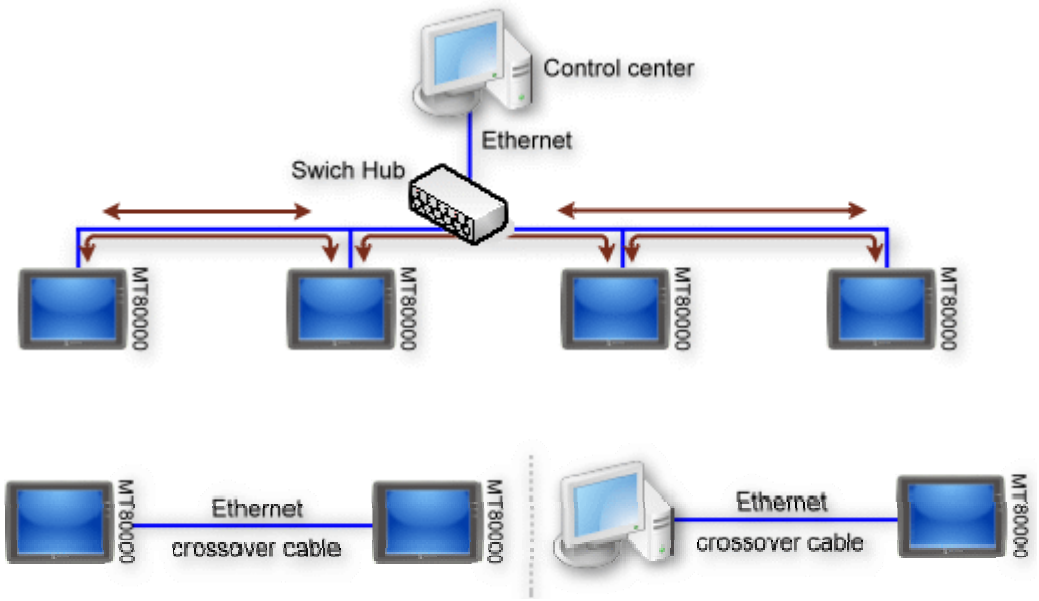
In order to prolong the life of machine's flash memory, the EB8000 will save Recipe Data automatically every five minutes to avoid losing the data because the machine shuts down. The EB8000 provides users with [LB9029] function to save Recipe Data manually. The EB8000 will save Recipe Data when users give the "ON" message to [LB9029]. But when users give the "ON" message to [LB9028], the EB8000 will set all Recipe Date back to 0.

Chapter 18 Ethernet Communication and Multi-HMIs Connection.

By using the Ethernet network, the EB8000 provides following methods for data transmission:

1. HMI to HMI communication.
2. PC to HMI communication.
3. Operating the PLC connected to other HMIs

There are two ways of the Ethernet communication; one way is to use RJ45 straight through cable with the use of a hub (hubs), and the other way is to use RJ45 crossover cable. In the second way there is no need to use hub(s), and it is limited to the condition of point to point connection (HMI to HMI, or PC to HMI). The following descriptions will show how to set up and perform the Ethernet connection in each way.



1. HMI to HMI Communication

Different HMIs can monitor and control each other's data through the Ethernet network. By using the system reserved register (LB and LW), one HMI can master performance of other HMI(s). One HMI can handle requests from a maximum of 32 other HMIs simultaneously.

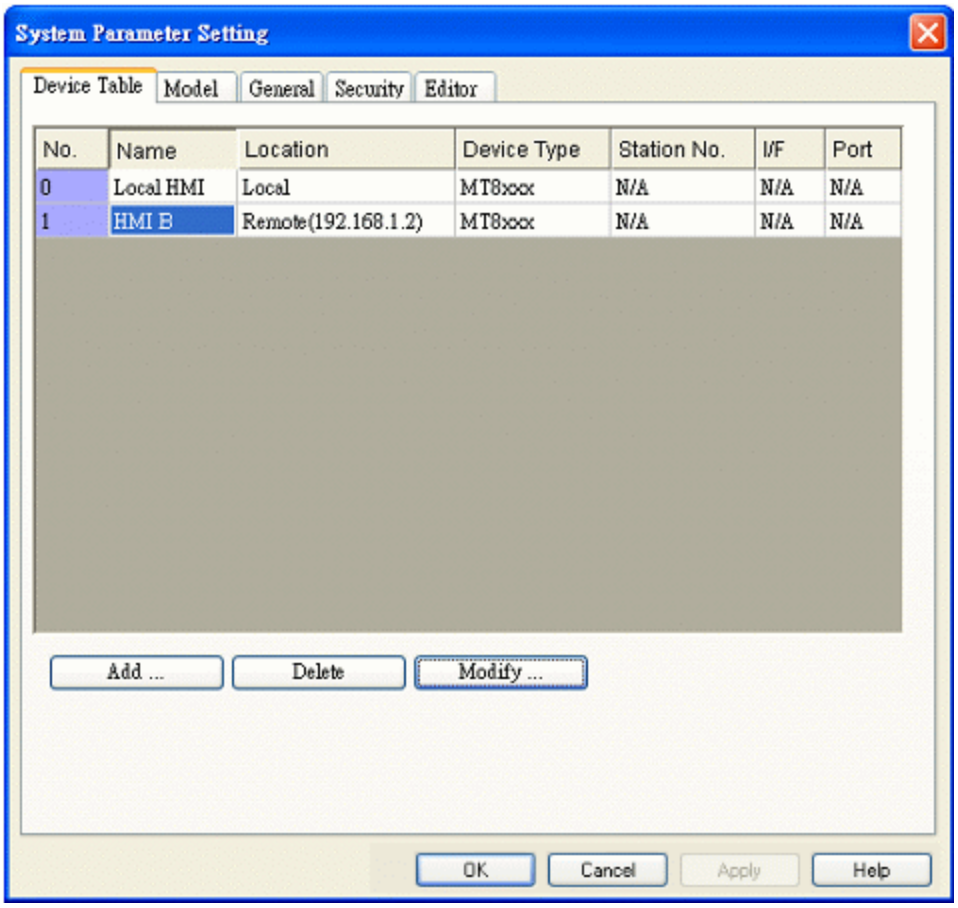
Here is an example of communicating two HMIs (HMI A and HMI B). When HMI A wants to use the set bit object to control the [LB123] node of HMI B, the procedure for setting the Project files (MTP) on HMI A is as follows:

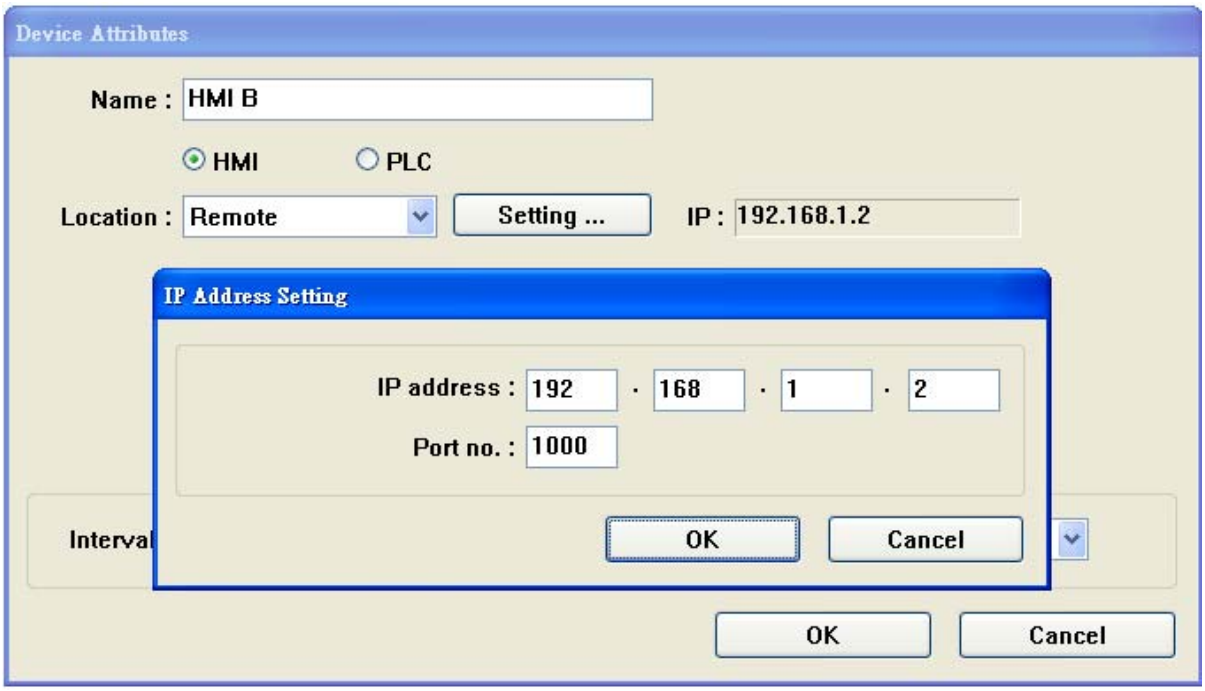
Step 1

Set the IP address of the two HMIs (Refer to the related chapter for the details). Suppose that the IP address of HMI A and HMI B are set for "192.168.1.1" and "192.168.1.2" respectively.

Step 2

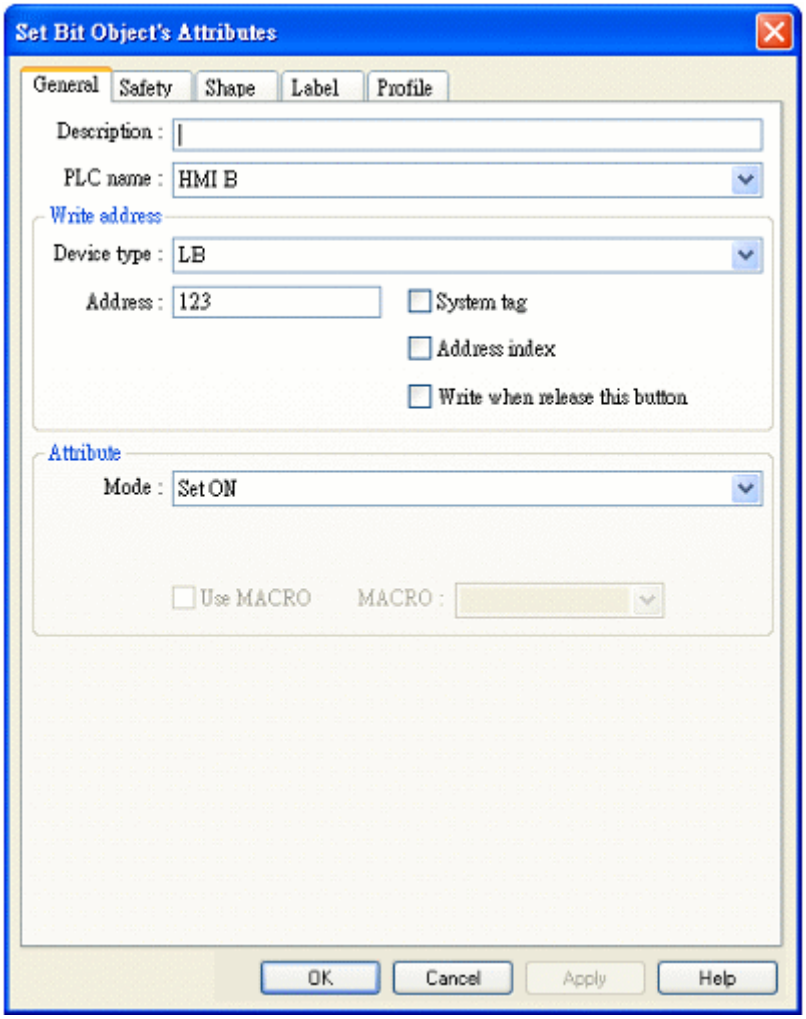
Running the EB8000, and select the [Device Table] tab on the [System Parameter Setting] menu, then add the IP address and Port number of HMI B. (The picture below shows the content of HMI A's MTP projects.)


System Parameter Setting
Device Table
Model
General
Security
Editor
No.
Name
Location
Device Type
Station No.
I/F
Port
0
Local HMI
Local
MT8xxx
N/A
N/A
N/A
1
HMI B
Remote(192.168.1.2)
MT8xxx
N/A
N/A
N/A
Add ...
Delete
Modify ...
OK
Cancel
Apply
Help

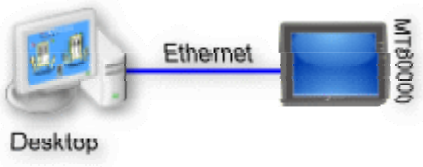

Device Attributes
Name :
HMI B
HMI
PLC
Location :
Remote
Setting ...
IP :
192.168.1.2
IP Address Setting
IP address :
192
168
1
2
Port no. :
1000
OK
Cancel
Interval
OK
Cancel

Step 3

Select “HMI B” for [PLC name] on the “Set Bit Object’s Attributes” menu, and now HMI A can operate the content of the LB of HMI B.



2. PC to HMI Communication



By using the simulator Function of the EB8000, PC can catch HMI's data through the Ethernet network and save the data as files on computer.

PC can master HMI by operating the system reserved register (LB and LW) of HMI. On the contrary, HMI can also directly control PC's operation, for example, asking PC save data from HMI or PLC.

The number of HMIs mastered by PC is unlimited.

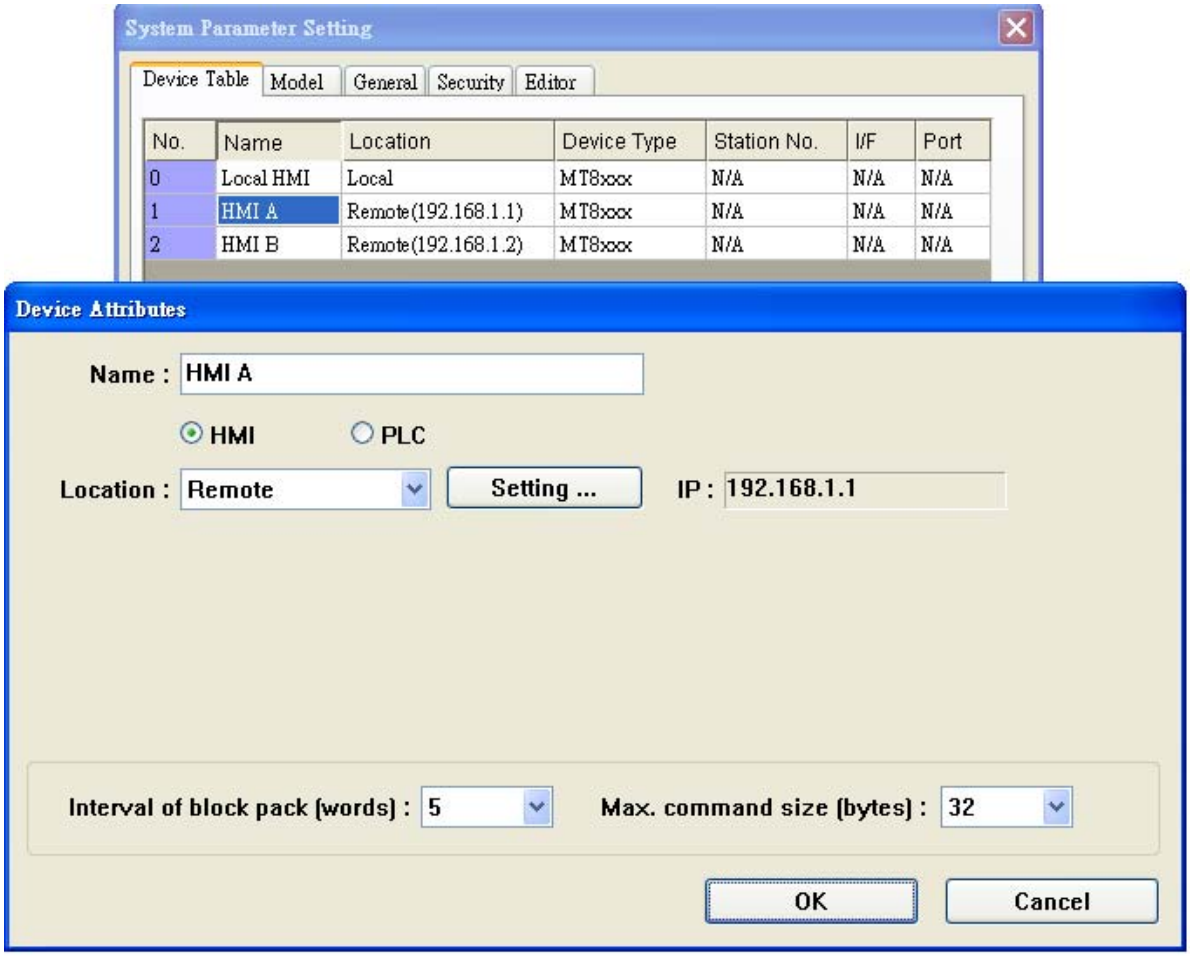
Suppose that PC is going to communicate with two HMIs (HMI A and HMI B)，the procedure for setting PC's MTP projects is as follows:

Step 1

Set the IP address of the two HMIs (Refer to the related chapter for the details). Suppose that the IP address of HMI A and HMI B are set for "192.168.1.1" and "192.168.1.2" respectively.

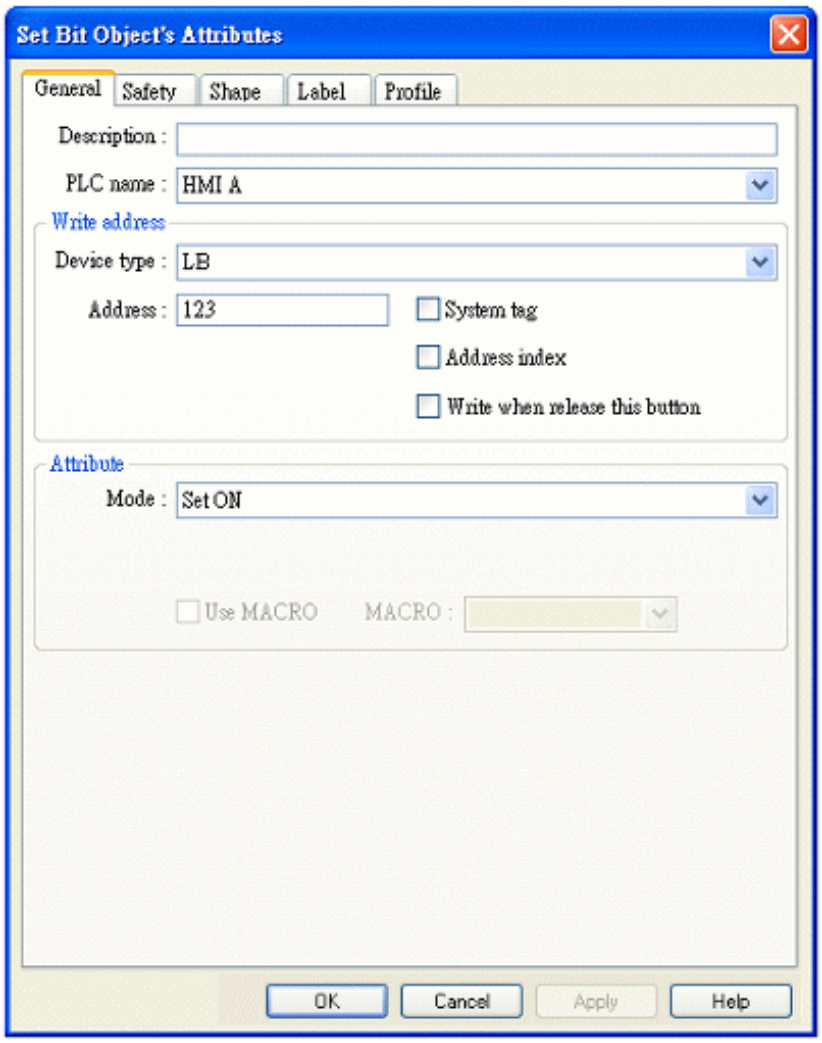
Step 2

Running the EB8000, and select the [Device Table] tab on the [System Parameter Setting] menu, then add the IP addresses and Port numbers of HMI A and HMI B.



Step 3

Select correct PLC for [PLC name]. In the [General] tab on the [Set Bit Object's Attributes] menu, if you intend to control the LB of HMI A, you have to select "HMI A" for [PLC name]. See the picture below.

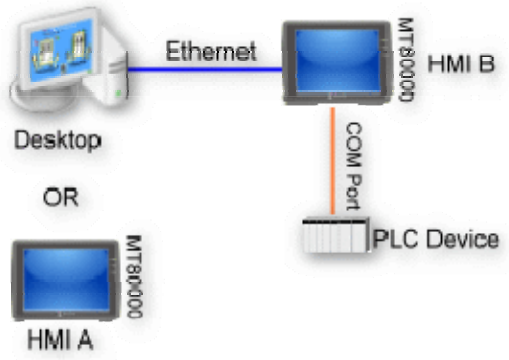


Step 4

Making use of HMI's MTP projects on PC and performing the simulator function (either online mode or offline mode), and then all HMI's data can be controlled by PC.

It is also available for HMI to control PC's data. Just considering the PC another HMI to add it as a new HMI device to the MTP projects of HMI A or HMI B and set the IP address pointing to the PC.

3. Operate the PLC connected with other HMIs.



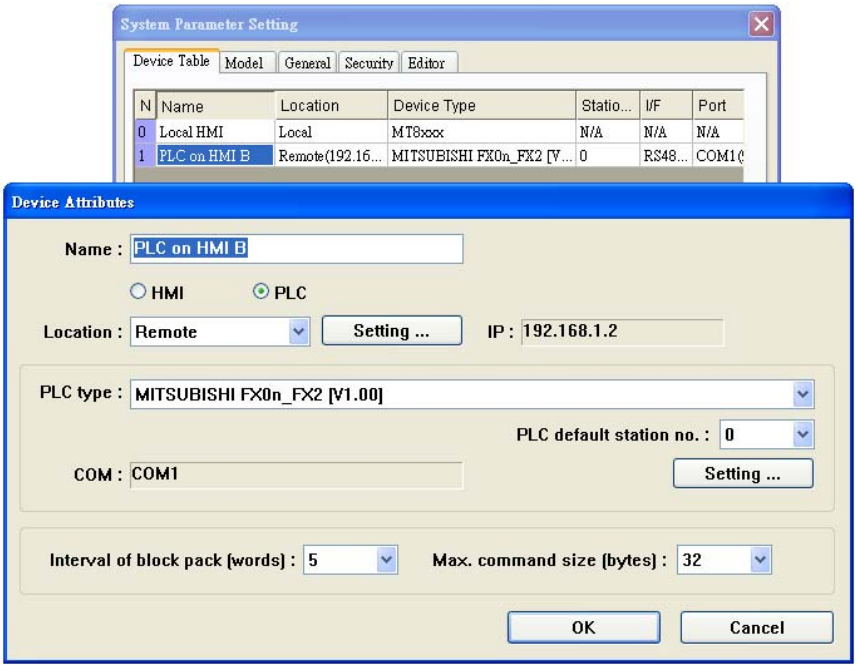
Through the Ethernet network, PC and HMI can also operate PLC that is connected to other HMI; for example, suppose that there is a Mitsubishi PLC connected to HMI B's COM 1, when PC or HMI A wants to read data of the PLC, the procedure for setting PC or HMI A's MTP projects is as follows:

Step 1

Set the IP address of HMI B; suppose the IP address of HMI B is set for "192.168.1.2".

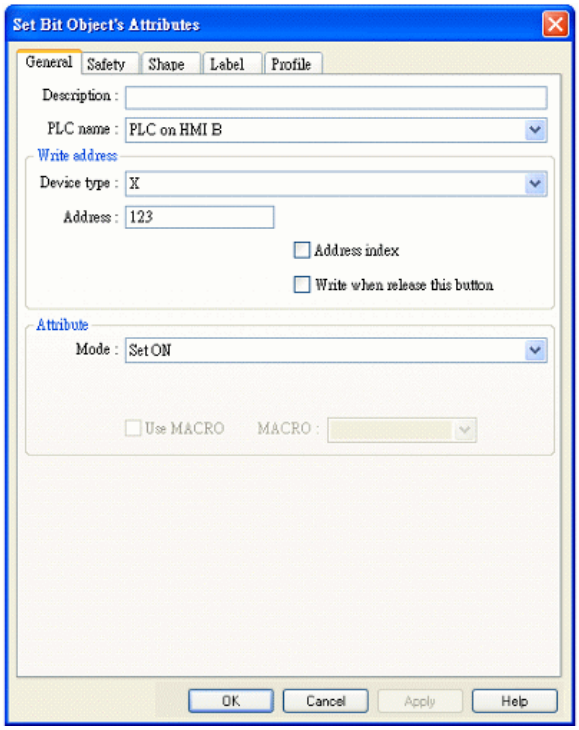
Step 2

Running the EB8000, and select the [Device Table] tab on the [System Parameter Setting] menu, then add a PLC device (defined as Mitsubishi FX0n_FX2 in the example below) and set the correct communication parameters.



Step 3

In the case of using the set bit object to operate the Mitsubishi PLC connected to HMI B, just need to select “PLC on HMI B” for [PLC name] on the [General] tab on the [Set Bit Object’s Attributes] menu, then it is able to operate the PLC connected to the remote HMI B on PC through the simulator function .



Chapter 19 HMI State Controlling (System Reserved Register Addresses)

Normal States and Control

Address	Description	Read & Write	Remote HMI Control
LB-900n	n = 0~9 When the HMI starts up, the initial states of these bits will be set as ON.	R/W	Yes
LB-9017	When the state is ON, it will disable the return function of [PLC Control] [Change Base Window].	R/W	Yes
LW-9050	File numbers of the base windows that are currently displaying on the machine.	R	Yes
LW-9100 ~ LW-9115	File names of the MTP projects used by the machine.	R	Yes
LW-9116 ~ LW-9117	Sizes of MTP projects (unit: byte).	R	Yes
LW-9118 ~ LW-9119	Sizes of MTP projects (unit: K byte).	R	Yes
LW-9120 ~ LW-9121	Version of complier that is used for MTP projects.	R	Yes
LW-9122	Time (year) of MTP project being produced.	R	Yes
LW-9123	Time (month) of MTP project being produced.	R	Yes
LW-9124	Time (day) of MTP project being produced.	R	Yes
LW-9125	The Ethernet IP0 used by the machine. (The real addresses are IP0. IP1. IP2. IP3.)	R	Yes
LW-9126	The Ethernet IP1 used by the machine.	R	Yes
LW-9127	The Ethernet IP2 used by the machine.	R	Yes
LW-9128	The Ethernet IP3 used by the machine.	R	Yes
LW-9129	The Ethernet gateway 0 used by the machine. (The real addresses are gateway 0. gateway 1. gateway 2. gateway 3.)	R	Yes
LW-9130	The Ethernet gateway 1 used by the machine.	R	Yes
LW-9131	The Ethernet gateway 2 used by the machine.	R	Yes
LW-9132	The Ethernet gateway 3 used by the machine.	R	Yes

States of Data Input

Address	Description	Read & Write	Remote HMI Control
LW-9002 ~ LW-9003	Maximum value that is input by the currently used data inputting object. The data format is 32-bit float.	R	No
LW-9004 ~ LW-9005	Minimum value that is input by the currently used data inputting object. The data format is 32-bit float.	R	No
LW-9150 ~ LW-9181	Data that is input with the keypad, saved in the ASCII format and the length of data is 32 words.	R	No
LW-9540	Reserved for the use of the Caps Lock key on the keypad.	R	No

Recipe Data

Address	Description	Read & Write	Remote HMI Control
LB-9010	ON when recipe data are being downloaded.	R	Yes
LB-9011	ON when recipe data are being uploaded.	R	Yes
LB-9012	ON when recipe data are being downloaded/uploaded.	R	Yes
LB-9028	When ON message is sent to the register, all recipe data will be set for 0.	R	Yes
LB-9029	The EB8000 will automatically save recipe data (RW or RWA) on the machine every 5 minutes. When ON message is sent to the register, recipe data will be compulsorily saved on the machine.	R	Yes

Task Button and Fast Selection Window

Address	Description	Read & Write	Remote HMI Control
LB-9013	Disable Fast Selection Window when ON message is sent to the register. Enable Fast Selection Window when OFF message is sent to the register.	W	No
LB-9014	Disable Task Button when ON message is sent to the register. Enable Task Button when OFF message is sent to the register.	W	No
LB-9015	Disable Fast Selection Window/Task Button when ON message is sent to the register. Enable Fast Selection Window/Task Button when ON message is sent to the register.	W	No

Event Logging

Address	Description	Read & Write	Remote HMI Control
LB-9021	When ON message is sent to the register, all event logs of the day on the machine will be deleted.	W	Yes
LB-9022	When ON message is sent to the register, the oldest event log on the machine will be deleted. (The function can only work for event logs on the machine.)	W	Yes
LB-9023	When ON message is sent to the register, all event logs of the machine will be deleted. (The function can only work for event logs on the machine.)	W	Yes
LB-9024	When ON message is sent to the register, it will re-measure the file sizes of all event logs on the machine. (The function can only work for event logs on the machine.)	W	Yes
LW-9223	The number of event logs on the machine.	R	Yes
LW-9224	The file sizes of all event logs on the machine (32-bit Unsigned).	R	Yes

Data Logging

Address	Description	Read & Write	Remote HMI Control
LB-9025	When ON message is sent to the register, the oldest data sampling on the machine log will be deleted. (The function can only work for data sampling logs on the machine.)	W	Yes
LB-9026	When ON message is sent to the register, all data sampling logs on the machine will be deleted. (The function can only work for data sampling logs on the machine.)	W	Yes
LB-9027	When ON message is sent to the register, it will re-measure the file sizes of all data sampling logs on the machine. (The function can only work for data sampling logs on the machine.)	W	Yes
LW-9226	The number of data sampling logs on the machine.	W	Yes
LW-9227	The file sizes of all data sampling logs on the machine (32-bit Unsigned).	W	Yes

Password and Operation Level

Address	Description	Read & Write	Remote HMI Control
LB-905n	n = 0~5, when ON message is sent to this address, the user's operation level will be lowered to level n. This function is only available to lower the user's operation level.	R/W	No
LB-9060	ON when a password error occurs.	R/W	No
LB-9061	When ON message is sent to this address, the HMI will use the data stored in [LW9500] to [LW9535] to update the password.	R/W	No
LW-9219	For judging the data input in [LW9220] are from user 1, user 2, or user 3.	R/W	No
LW-9220 ~ LW-9221	Addresses for password entering (32-bit).	R/W	No
LW-9222	Level (0~6) of currently entered password.	R/W	Yes
LW-9500 ~ LW-9501	A new password for user 1's level 1	R/W	No
LW-9502 ~ LW-9503	A new password for user 1's level 2	R/W	No
LW-9504 ~ LW-9504	A new password for user 1's level 3	R/W	No
LW-9506 ~ LW-9505	A new password for user 1's level 4	R/W	No
LW-9508 ~ LW-9506	A new password for user 1's level 5	R/W	No
LW-9510 ~ LW-9511	A new password for user 1's level 6	R/W	No
LW-9512 ~ LW-9513	A new password for user 2's level 1	R/W	No
LW-9514 ~ LW-9515	A new password for user 2's level 2	R/W	No
LW-9516 ~ LW-9517	A new password for user 2's level 3	R/W	No
LW-9518 ~	A new password for user 2's level 4	R/W	No

LW-9519			
LW-9520 ~ LW-9521	A new password for user 2's level 5	R/W	No
LW-9522 ~ LW-9523	A new password for user 2's level 6	R/W	No
LW-9524 ~ LW-9525	A new password for user 3's level 1	R/W	No
LW-9526 ~ LW-9527	A new password for user 3's level 2	R/W	No
LW-9528 ~ LW-9529	A new password for user 3's level 3	R/W	No
LW-9530 ~ LW-9531	A new password for user 3's level 4	R/W	No
LW-9532 ~ LW-9533	A new password for user 3's level 5	R/W	No
LW-9534 ~ LW-9535	A new password for user 3's level 4	R/W	No

Time of HMI

Address	Description	Read & Write	Remote HMI Control
LW-9010	Local time (second, BCD)	R/W	Yes
LW-9011	Local time (minute, BCD)	R/W	Yes
LW-9012	Local time (hour, BCD)	R/W	Yes
LW-9013	Local time (day, BCD)	R/W	Yes
LW-9014	Local time (month, BCD)	R/W	Yes
LW-9015	Local time(year, BCD)	R/W	Yes
LW-9016	Local time (week, BCD)	R	Yes
LW-9017	Local time (second, BIN)	R/W	Yes
LW-9018	Local time (minute, BIN)	R/W	Yes
LW-9019	Local time (hour, BIN)	R/W	Yes
LW-9020	Local time (day, BIN)	R/W	Yes
LW-9021	Local time (month, BIN)	R/W	Yes
LW-9022	Local time (year, BIN)	R/W	Yes
LW-9023	Local time (week, BIN)	R	Yes
LW-9030 ~ LW-9031	System time (in units of 0.1 second), timing from the machine starts up.	R	Yes

Hardware of HMI

Address	Description	Read & Write	Remote HMI Control
LB-9019	ON when the buzzer is turned on, and OFF when the buzzer is turned off. The current state will remain until next startup of the machine.	R/W	No
LB-9040	When ON message is sent to the register, the brightness of CCFL backlight can be increased.	W	Yes
LB-9041	When ON message is sent to the register, the brightness of CCFL backlight can be decreased.	W	Yes
LW-9040	The brightness value of CCFL backlight, ranging from 0 to 31. At the first time using the machine, adjust the brightness of CCFL backlight to the darkest or the brightest, and the value will be set at 0 or 31 as a criterion for brightness adjustment in the future.	W	Yes

The States of Communicating with Remote HMI(s)

Address	Description	Read & Write	Remote HMI Control
LB-910n	n = 0~31 The registers can be used to indicate the states of communication with remote HMIn. When the state is ON, it indicates the communication is normal. When the state is OFF, it indicates the disconnection to remote HMIn; at this time set the state at ON, and the system will try connecting to remote HMIn again.	R/W	Yes

The States of Communicating with PLC

Address	Description	Read & Write	Remote HMI Control
LB-9150	When the state is ON, the system will automatically resume connection if the PLC device on COM 1 is disconnected. When the state is OFF, the disconnection to the PLC device will be ignored.	R/W	Yes
LB-9151	When the state is ON, the system will automatically resume connection if the PLC device on COM 2 is disconnected. When the state is OFF, the disconnection to the PLC device will be ignored.	R/W	Yes
LB-9152	When the state is ON, the system will automatically resume connection if the PLC device on COM 3 is disconnected. When the state is OFF, the disconnection to the PLC device will be ignored.	R/W	Yes
LB-9153 ~ LB-9184	When the state is ON, the system will automatically resume connection if the PLC device on the Ethernet port is disconnected; n = 0~31. When the state is OFF, the disconnection to the PLC device will be ignored.	R/W	Yes
LB-9200 ~ LB-9455	The registers can be used to indicate the states of communication with the PLC device on COM 1. LB9200 is to indicate the states of communication with the PLC on the station no. 0, LB9201 is to indicate the states of communication with the PLC on the station no. 1, and the rest can be deduced accordingly. When the state is ON, it indicates the communication is normal. When the state is OFF, it indicates the disconnection to the PLC device; at this time set the state at ON, and the system will try connecting to the PLC device again.	R/W	Yes

LB-9500 ~ LB-9755	The registers can be used to indicate the states of communication with the PLC device on COM 2. LB9500 is to indicate the states of communication with the PLC on the station no. 0, LB9501 is to indicate the states of communication with the PLC on the station no. 1, and the rest can be deduced accordingly. When the state is ON, it indicates the communication is normal. When the state is OFF, it indicates the disconnection to the PLC device; at this time set the state at ON, and the system will try connecting to the PLC device again.	R/W	Yes
LB-9800 ~ LB-10055	The registers can be used to indicate the states of communication with the PLC device on COM 3. LB9800 is to indicate the states of communication with the PLC on the station no. 0, LB9801 is to indicate the states of communication with the PLC on the station no. 1, and the rest can be deduced accordingly. When the state is ON, it indicates the communication is normal. When the state is OFF, it indicates the disconnection to the PLC device; at this time set the state at ON, and the system will try connecting to the PLC device again.	R/W	Yes
LB-10100~ LB-10131	The registers can be used to indicate the states of communication with the PLC device on the Ethernet port. When the state is OFF, it indicates the disconnection to the PLC device; at this time set the state at ON, and the system will try connecting to the PLC device again.	R/W	Yes
LW-930n	The number of the driver that is used by local PLC device.	R	Yes
LW-935n	The number of unprocessed commands that are gave to the local PLC device.	R	Yes
LW-940n	The content of the latest connection error when connecting to the local PLC device.	R	Yes